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Report of an Epidemic of Poliomyelitis in Ottawa, 1929

T. A. LOMER and W. T. SHIRREFF

A New Wheat Irradiated Biscuit

F. F. TISDALL, T. G. H. DRAKE,
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Poliomyelitis in Ontario, 1929

R. P. HARDMAN and A. L. MCKAY

Tularemia

The First Case Reported in Canada

A. L. McNABB

Pre-School Examination

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Report of an Epidemic of Poliomyelitis in Ottawa, 1929

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Medical Officer of Health, Ottawa

AND

DR. W. T. SHIRREFF,

Superintendent of Strathcona Hospital

ON account of the prevalence of poliomyelitis in Manitoba in 1928, it was considered probable by the Ontario Department of Health that the Province of Ontario might be visited by the disease in 1929, and local health authorities were warned to be on the lookout for cases and to prepare lists of possible donors of convalescent serum.

Incidence

The first case of poliomyelitis reported in Ottawa was on July 28th,

TABLE I
POLIOMYELITIS—OTTAWA, 1929
CASES BY WEEKS

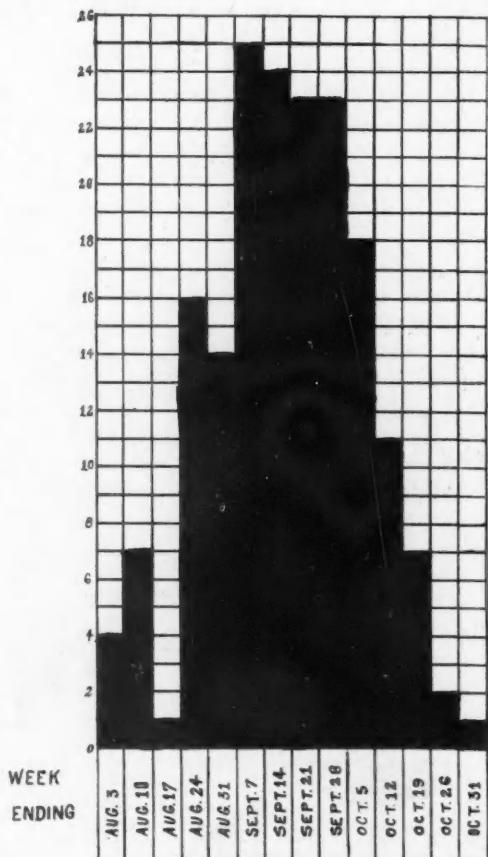
Week Ending	Number	Per cent
August 3	4	2.3
August 10	7	4.0
17	1	.6
24	16	9.1
31	14	7.9
September 7	25	14.2
14	24	13.6
21	23	13.1
28	23	13.1
October 5	18	10.2
12	11	6.2
19	7	4.0
26	2	1.1
	1	.6
Total	176	100.0

although subsequent investigation showed that there had been at least two cases in the vicinity during the previous week.

All the earliest cases reported from the surrounding districts occurred to the west of Ottawa, and it would appear as though the disease had spread to this city from the west.

Four cases were reported during the first week of the epidemic, seven the second week, and only one on the third, which gave rise to the hope that the epidemic was a small one and already on the decline. The fourth week, however, showed an increase to sixteen cases, and it

DIAGRAM I
POLIOMYELITIS
OTTAWA, 1929
CASES BY WEEKS



was evident that the epidemic was to be of serious proportions, as was subsequently borne out by the fact that for two months the weekly number of cases reported ranged from 11 to 25.

The incidence of the cases by weeks is shown in Table I and Diagram I.

In all, 176 cases were reported which were considered definitely poliomyelitis. Of these 23 originated outside the city of Ottawa but

were brought into the city for treatment, some being residents of the city taken ill at summer resorts and others being residents of neighbouring municipalities in Ontario and Quebec.

During the earlier part of the epidemic there was a noticeable concentration of cases in two districts of the city, one a medium class residential district near the centre, and the other a more wealthy residential district at the eastern edge. However, after a few weeks the disease had appeared all over the city with the exception of one district. Ottawa South was the last part of the city to be affected and no cases appeared in this large area during the first nine weeks of the epidemic.

TABLE II
POLIOMYELITIS—OTTAWA, 1929
INCIDENCE BY AGE IN SINGLE YEARS

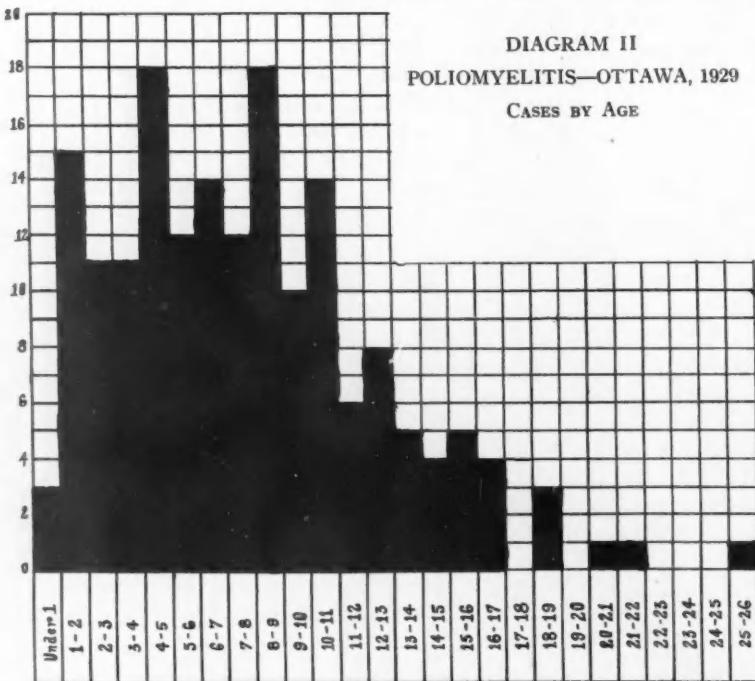
Age	Number	Per cent
0-1	3	1.7
1	15	8.5
2	11	6.2
3	11	6.2
4	18	10.2
5	12	6.8
6	14	8.0
7	12	6.8
8	18	10.2
9	10	5.7
10	14	8.0
11	6	3.4
12	8	4.5
13	5	2.8
14	4	2.3
15	5	2.8
16	4	2.3
17	0	...
18	3	1.7
19	0	...
20	1	.6
21	1	.6
22	0	...
23	0	...
24	0	...
25	1	.6
Total	176	100.00

The only section of Ottawa which showed no cases was the north-western part formerly known as Mechanicsville. This section is composed for the most part of detached houses, chiefly of frame construction occupied by persons of small income and with large families. While the conditions here are by no means slum conditions it is probable that a combination of overcrowding and small financial means exists to a larger extent in this area than in other parts of the city.

Investigation of premises at which cases occurred did not reveal anything which would point to sanitary or social conditions or the

presence of flies or other insects as being factors in the spread of the disease.

In only four instances were two cases reported from the same premises. In the first instance two out of three children of a family developed the disease three days apart. The next case was that of a maid of eighteen years who developed poliomyelitis six days after the only child in the house was affected. In another house the only two children became ill three days apart. The fourth instance is that of two children of $2\frac{1}{2}$ and 4 years living in different apartments in an apartment house who developed the disease two days apart.



Climatic conditions during the course of the epidemic may be referred to only to mention that the weather locally was unusually fine with more than the average of clear sunny weather lasting late into the autumn and with a rainfall considerably below the average. The water level of the Ottawa River fell $3\frac{1}{2}$ feet below the average for the time of the year and many wells in the country districts surrounding the city were nearly or completely dry. The river level reached its lowest point on September 3rd, and was still much below normal at the end of October.

The incidence by age is shown in Tables II and III and Diagrams II and III.

The ages of the patients ranged from seven months to twenty-five years, averaging 7.43 years with a maximum incidence between four and five and between eight and nine years.

TABLE III
POLIOMYELITIS—OTTAWA, 1929
INCIDENCE BY AGE GROUPS

Age	Number	Percent
0- 2	29	16.5
3- 5	41	23.3
6- 8	44	25.0
9-11	30	17.0
12-14	17	9.7
15-17	9	5.1
18-20	4	2.3
21+	2	1.1
Total	176	100.0

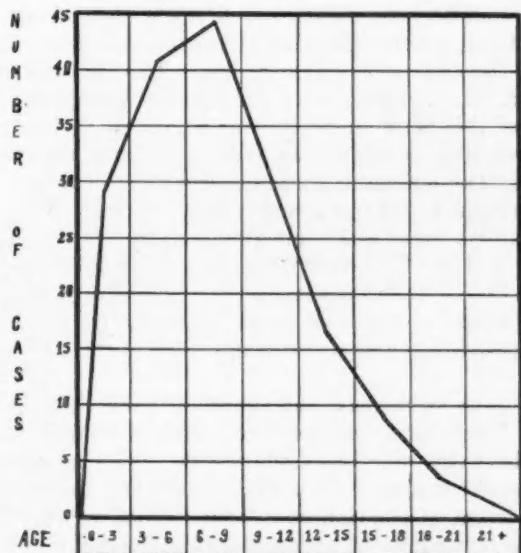


DIAGRAM III
POLIOMYELITIS
OTTAWA, 1929
INCIDENCE BY AGE
GROUPS

A noteworthy feature is the comparative rarity of the disease during the first year of life which emphasizes the undesirability of the term infantile paralysis.

Sixty per cent of all cases reported were males.

CONTROL MEASURES

Supply of Convalescent Serum

As the outbreak of poliomyelitis was not altogether unexpected the Local Health Department had prepared a partial list of recovered cases of the disease who might be available as donors in case of necessity, and when the first cases were reported these donors were immediately called on and a limited supply of serum obtained. On August 10th and again about a week later a small supply was obtained from the Department of Health of Ontario in Toronto, but the demands from the rest of the province required most of their available supply. An additional amount of 350 cc. was obtained from Winnipeg through the kind assistance of Dr. F. Cadham.

The fact that during the third week of the outbreak only one case of poliomyelitis was reported misled us as to the amount of serum that was likely to be required, and the large increase of cases the following week made it difficult to secure an adequate supply.

By advertising in the daily press the need for donors, we were able to secure a considerable number from the city and surrounding districts, but our chief source of supply was Crippled Children's Clinic.

This Clinic, which had been organized seven years ago through the efforts of the Rotary Club, numbered among its patients many whose disability was due to the effects of poliomyelitis. Through the energetic assistance of Mr. R. G. Cameron of the Rotary Club, who had access to the records of this clinic and who was personally acquainted with all the patients, we were quickly able to secure a large number of donors and throughout the epidemic these cases were called upon in groups and formed the mainstay of our serum supply. I wish to express my deep appreciation of the great assistance rendered by Mr. Cameron, and by Dr. J. Murray and Dr. G. Armstrong, the Orthopaedic Specialists in charge of the clinic. It is largely due to their efforts that we were able not only to secure a supply of serum sufficient for the needs of the city but also to provide assistance to many cases in the surrounding districts.

In all fifty-nine donors were used and provided a total amount of 14,000 cc. of blood. Their ages ranged from eight to thirty years, the mean age being between nineteen and twenty. The amount of blood withdrawn at a time ranged from 50 cc. to 470 cc., the average being about 200 cc. Eight of the donors supplied blood twice. The length of time since the occurrence of poliomyelitis in the donors varied from two to twenty-three years and averaged thirteen years. None of the cases occurring in this epidemic were used as donors.

The blood was paid for at the usual rate by the city and the money paid was refunded by the Ontario Department of Health who assumed the full cost of the supply of serum.

The donors were taken in groups to the Ottawa Civic Hospital where the blood was withdrawn, and the serum was prepared in the Pathological Department of the hospital by Dr. Thomas Little whose assistance and co-operation were of the utmost value.

Dr. Little's description of the technique used in preparing the serum is given by him as follows:—

A suitable vein was chosen at the bend of the elbow and the area was covered with tincture of iodine. A dental rubber tourniquet was applied. During the collection of the blood, the tourniquet was not removed and the donors were requested to open and close their hands at the rate of about 15 times per minute to facilitate rapid withdrawal. A number 16 gauge $1\frac{1}{2}$ " needle was used with about 6" of rubber tubing attached to it.

The blood was collected directly into sterile, 16 oz. ordinary, flat bottles. They were placed in the refrigerator in a slanting position of about 10 degrees and at a temperature of about 34 degrees F. for 18 to 24 hours. This allowed better shrinkage of the clot than would be obtained in an upright position.

The serum was poured off into sterile containers. Five cc. was cultured for possible contamination. About 2 cc. was tested serologically for Wassermann and Kahn reactions. The preservative used was tricresol 0.02 cc. per 100 cc. serum.

Publicity and Education

After the second week of the epidemic it was apparent that, although a supply of convalescent serum was available, the cases were not being received at a sufficiently early stage for serum treatment to be of any value. It was evident, therefore, that both the medical profession and the public needed information as to the early signs and symptoms of the disease and required to be impressed with the importance of early diagnosis. With this end in view a circular was sent to every physician detailing the diagnostic features of the pre-paralytic stage of poliomyelitis, urging the importance of early treatment, and giving a list of consultants whose services could be called on without charge.

A meeting of the Medical Society was called for the purpose of discussing the subject of poliomyelitis and a complete symposium of this subject was given, particular attention being paid to the diagnosis in the pre-paralytic stage.

Consultants were appointed by the Board of Health from leading members of the profession in the city to act as diagnosticians in cases of suspected infantile paralysis. These consultants gave their services voluntarily.

To instruct the public, the daily press published articles giving the early symptoms of the disease and stressed the fact that it was curable if treated sufficiently early. Parents were advised to call in a physician

if any suspicious symptoms were noted and provision was made for free diagnosis and treatment for any who could not afford to pay. Throughout the epidemic the press published daily reports of the number of cases occurring and kept the public informed as to the progress of the epidemic.

Schools

As the epidemic was well established by the end of August the question was raised as to the advisability of postponing the opening of schools. It was the opinion of the Board of Health that nothing would be gained thereby unless at the same time all children were excluded from churches, Sunday Schools and places of entertainment, and also unless they could be prevented from congregating in playgrounds and on the streets. Moreover, it was considered that the intelligent supervision of the school population by teachers and nurses might be a means of getting early medical attention to suspected cases.

Many parents, however, decided to keep their children out of school, and the attendance during September was from fifteen to twenty per cent below normal, gradually increasing to five per cent below normal in late October. In the lower grades the attendance was particularly affected.

Parents were not urged to send their children to school, and if they were summering in an uninfected locality, were advised to remain there. It is noteworthy, however, that the disease was reported in at least five popular summer resorts, all situated in the Ottawa Valley to the west of the city.

It is very doubtful if the closure of schools would show any beneficial result in controlling the incidence of poliomyelitis; at any rate, the epidemic reached its peak during the week that the schools opened and from that time gradually declined. Moreover, during the first few weeks of the school term the incidence of the disease among children of school age who had been kept out of school was proportionately as great as among those attending.

Hospitalization

As there was ample accommodation and few other cases in the Strathcona Hospital, it was deemed advisable to treat all cases who so desired in this institution.

Eighty per cent or 141 of the 176 definite cases were admitted to the hospital, and in addition 40 other suspected cases which were diagnosed as other conditions or whose symptoms and cell counts were not sufficiently characteristic to warrant a definite diagnosis of poliomyelitis.

The patients were kept in hospital for three weeks and in no case did any cross infection occur and no return cases developed after

discharge. None of the suspected cases developed poliomyelitis while in the hospital or after discharge, but it must be noted that nearly all these received 20 to 25 cc. of serum on admission.

Quarantine

Those patients who were treated at home were quarantined in accordance with the Ontario Regulations. The patient was isolated, the house placarded, concurrent disinfection ordered and terminal disinfection carried out. This last measure was in response to popular demand and to allay uneasiness rather than from any conviction as to its efficacy.

Children known to be exposed to the disease were excluded from school for ten days and were kept under observation.

REPORT OF POLIOMYELITIS CASES ADMITTED TO HOSPITAL

In all 181 suspected cases were brought to the hospital for diagnosis or treatment.

Fifteen of these cases had lumbar puncture done and having a cell count of less than 10 and not sufficient specific symptoms to warrant a diagnosis of poliomyelitis were sent home after receiving 20 cc. of serum.

Twenty-five other cases that were admitted as suspected poliomyelitis were later diagnosed as other conditions or, on account of low cell counts (below 10) and lack of sufficiently diagnostic symptoms, were finally classed as doubtful cases and have been eliminated from the statistical report. All these also received serum at the time of admission when lumbar puncture was done. In this group were found three cases of pneumonia, two of pyelitis and one each of brain tumour, diphtheria, scarlet fever, acute rheumatic fever and meningococcus meningitis.

After eliminating all doubtful cases there remained 141 which were considered definitely poliomyelitis and which form the basis of the following report. All these cases had a number of the cardinal symptoms or a sufficiently high cell count to warrant classing them definitely as positive cases.

Lumbar puncture was done in all but three cases except in those who had shown characteristic paralysis for some days before admission and where there could be no doubt as to the diagnosis. In most cases an anaesthetic was administered for the operation as it was found early in the epidemic that much more satisfactory results could be obtained thereby. Ether was used for children and a local anaesthetic for adults.

In 18 cases no cell counts were made; 15 of these were cases which were already paralysed on admission and in three others the count was impossible owing to the presence of blood or for other reasons.

Five cases that had an initial cell count of less than 10 showed higher figures in subsequent counts, in one instance an increase from five to eighty after thirty-six hours.

The spinal fluids of 132 cases showed the following counts:—

Below 10 cells—	5 cases.
10 to 25 cells—	35 cases.
25 to 50 cells—	26 cases.
50 to 100 cells—	30 cases.
Over 100 cells—	36 cases.

Of the last group several counts were over 200 and two over 500 cells.

TREATMENT

Convalescent poliomyelitis serum was administered to all cases in which paralysis had not been established for more than two days.

Twenty-five cc. was the usual dose administered intramuscularly deep in the buttocks. Early in the epidemic, the supply of serum being limited, only definite cases were given the injection but, later on, when the supply was ample, both definite and suspected cases were given serum at the time the lumbar puncture was done. In four cases a second dose of serum was given when, after the initial drop in temperature, the temperature rose again and the headache and rigidity persisted. No other treatment was given except that all patients were confined to bed for two weeks and any paralysed cases for the total time in hospital. Paralysed limbs were also immobilized.

SYMPTOMS

The various subjective symptoms occurred in 141 cases in the proportions shown in Table IV.

Fever was present in all but seventeen cases and nine of these were patients who were not seen until paralysis had set in who had been ill six days or more. Eight only of those seen early had no temperature on admission. In very few cases was the fever over 103, the majority being from 100 to 102.

Headache was the next most common symptom. It was frequently described as severe and, when localized was generally frontal. Headache, together with fever and vomiting formed the three symptoms which were most prevalent early in the disease. Rigidity of the neck and pain in the back or limbs which were considered more specific symptoms did, in some cases, occur early but in most cases were a later manifestation than fever, headache and vomiting.

Rigidity of the neck occurred in sixty-two per cent of the cases and pain or stiffness of the back or limbs in forty-seven per cent, but in

only seventeen per cent of the total cases was neither symptom present, and of these ten were cases seen late, who were already paralysed.

It might be of interest to call attention to the fact that the rigidity of the neck encountered in these cases is quite distinct from that seen

TABLE IV
POLIOMYELITIS—OTTAWA, 1929
FREQUENCY OF SYMPTOMS IN 141 CASES

Symptom	Number	Percentage
Fever.....	124	88
Headache.....	92	65
Rigidity of neck.....	87	62
Vomiting.....	72	51
Pain in back or limbs.....	66	47
Anorexia.....	34	24
Drowsiness.....	30	21
Apathy.....	20	14
Nausea without vomiting.....	18	13
Diarrhoea.....	14	10
Abdominal pain.....	14	10
Sore throat.....	11	8
Irritability.....	11	8
Dizziness.....	6	4

in cerebro-spinal or other specific meningitis. Seldom is there any retraction. The rigidity is elicited mostly when the head is bent forward past the middle line, and there is little on lateral movement.

Abdominal pain was present in ten per cent of the cases and in two cases was so marked that a diagnosis of appendicitis was made.

Tremor and sweating, symptoms which had been reported as common in other epidemics, were noted in very few of our cases.

CLINICAL RESULTS

A summary of results is as follows:

Total cases treated.....	141	
Total cases recovered completely.....	109	77.4%
Total cases recovered with paralysis.....	29	20.5%
Number died having paralysis.....	2	1.4%
Number died without paralysis.....	1	.7%

Of the thirty-one showing terminal paralysis, twenty-six already had paralysis on admission, including two of the deaths, and our experience was that once paralysis was established the serum treatment had little effect on the result. This is not saying, nevertheless, what curative effect might result from massive doses of serum or repeated injections as no experiments were made along that line.

Deducting the twenty-six cases that had paralysis on admission we have 115 cases.

Of the 115 cases,

109 recovered completely	94.8%
5 recovered with paralysis	4.3%
(2 of which were very slight)	
1 died without paralysis9%

One of these cases which developed paralysis after receiving serum had, owing to temporary shortage of serum, received only 10 cc. on admission and developed paralysis within twenty-four hours thereafter.

Importance of Early Diagnosis

As illustrating the importance of early diagnosis in preventing paralysis by means of early treatment with convalescent serum it is of interest to compare the terminal conditions of the cases received in hospital during the first four weeks of the epidemic with those admitted during the last nine weeks.

Early in the epidemic neither the medical profession nor the public was familiar with the early manifestations of poliomyelitis but after the publicity given to this disease by the press and by means of circulars and Medical Society meetings, much earlier diagnosis was secured.

In the first four weeks of the epidemic,

- 23 cases were received in hospital.
- 17 had terminal paralysis.
- 14 of these had paralysis on admission, 2 of whom died.
- 3 developed paralysis after receiving serum, all within twenty-four hours.
- 6 recovered without paralysis.

Of the subsequent 118 cases,

- 107 recovered completely.
- 8 had paralysis on admission which in some cases was slightly improved on discharge.
- 2 developed paralysis after treatment but so slight as to be difficult to diagnose.
- 1 died without paralysis.

Whether this bears out the contention that most epidemics of poliomyelitis are more severe at the beginning or whether it were altogether due to the earlier diagnosis, cannot be answered except to say the average time the 31 paralysed cases were ill before a diagnosis was made was $4\frac{1}{2}$ days. The average time the unparalysed cases were sick before diagnosis and treatment was $1\frac{1}{2}$ days.

The following tables show the extent of paralysis in two groups of cases. The severity of the paralysis is indicated as—1, slight; 2, moderate; and 3, severe. No attempt has been made to subdivide according to the part of the limb involved.

REPORT OF AN EPIDEMIC OF POLIOMYELITIS

65

CASES ADMITTED WITH PARALYSIS

Case Number	Day of Illness on Admission	Cell Count	PARALYSIS						Condition on Discharge
			Right Arm	Left Arm	Right Leg	Left Leg	Face	Trunk	
495	6	-	1	1	2	1	1	3	+
496	5	-	2	2	3	2	1	+	Improved
499	5	-	1	2	1	1	1	+	Unimproved
502	5	-	1	1	2	1	1	+	Died
504	4	-	1	1	2	1	1	+	+
505	4	-	1	1	2	1	1	+	+
510	4	-	1	1	2	1	1	+	+
513	14	30	3	2	3	2	1	1	+
514	-	-	-	-	-	-	-	-	-
530	6	250	2	3	3	3	3	1	+
533	-	80	-	-	-	-	-	-	-
535	3	60	-	-	-	-	-	-	-
531	4	80	-	-	-	-	-	-	-
539	4	-	-	-	-	-	-	-	-
545	5	25	3	1	3	1	1	1	+
554	4	-	3	2	3	1	1	1	+
561	4	31	-	-	-	-	-	-	-
587	4	-	3	2	3	1	1	1	+
601	1	-	2	1	3	1	1	1	+
611	4	88	-	-	-	-	-	-	-
629	7	60	-	-	-	-	-	-	-
648	2	72	3	2	2	1	1	1	+
720	5	-	1	1	1	1	1	1	+
727	3	24	1	1	1	1	1	1	+
825	10	-	-	-	-	-	-	-	-
537	3	310	-	-	-	-	-	-	+

CASES DEVELOPING PARALYSIS AFTER TREATMENT

CONCLUSIONS

1. The treatment of poliomyelitis with convalescent serum administered in the pre-paralytic stage gave very good results.
2. The method of administration by intramuscular injection was simple and satisfactory.
3. The serum appeared to have little or no effect on those cases in which paralysis had begun.
4. The rapid fall of temperature and improvement of symptoms after serum treatment has some significance as a therapeutic diagnostic test.
5. A limited supply of convalescent serum should be at all times available for use in sporadic cases or at the beginning of an epidemic.
6. Complete and up-to-date lists of the names and addresses of possible donors should be kept for use in epidemics.
7. Early in an epidemic the medical profession and the public should be reminded of the pre-paralytic symptoms of poliomyelitis and of the supreme importance of early diagnosis; and facilities for diagnosis should be provided.
8. Definite information is desirable as to the relative therapeutic value of serum from treated and untreated cases.
9. Information is needed as to the possible efficacy of massive doses of serum given at the onset of paralysis.

REPORT OF THE THREE FATAL CASES

Case I. (No. 535)

Female, age 7 years. Previous history irrelevant. Illness began August 17th with vomiting and difficulty in swallowing, followed by fever, gradually became worse with high fever, difficulty in speaking clearly, choking spells, and at times twitching of muscles of arms and neck. Hypersensitive to noise.

When seen August 19th at 6 p.m. she had high fever and marked languor. Speech indistinct but no delirium. Very apprehensive especially when asked to drink. Marked dysphagia and suggestion of spasm of throat muscles simulating hydrophobia. Slight photophobia, some stiffness of neck muscles, occasional twitching of muscle bundles in arms and neck. Kernig's sign doubtful. Reflexes normal.

At 8 p.m. neck stiffer. No retraction. No paralysis except of speech. Sent to hospital same night. On admission was unconscious. Temperature 102. Cell count 60.

Died in coma, August 20th, eight hours after admission.

No autopsy.

Case II. (No. 537)

Female, age 4½ years, admitted August 19th. Had been sick for three days with vomiting, headache, stiffness of neck and later pain in right arm. Was taken to Civic Hospital where a lumbar puncture was done. Cell count 310.

Transferred to Strathcona Hospital same day. On arrival she showed marked weakness of right leg, pain in arms, back and legs. She was given 20 cc. of convalescent serum. Twelve hours later developed twitching of muscles, which soon subsided. Twenty-four hours after

admission, developed convulsions and died in ten minutes. No paralysis of respiratory muscles. No autopsy.

Case III. (No. 626)

Male child, age 2½ years, admitted 4 p.m. September 12th. Patient took ill on September 7th with headache, stiffness of right leg and some fever. On September 8th the fever persisted and the patient was nauseated. On September 9th, patient seemed better but later the fever returned and the stiffness of the neck and headache became more severe. The patient was brought to the hospital on the sixth day of illness. Lumbar puncture showed a cell count of 120. The temperature on admission was 105 and patient appeared extremely ill. There was no paralysis on admission.

20 cc. of serum given but patient gradually became worse developing rigidity of the limbs fifteen hours after admission and died three hours later.

This patient showed no definite paralysis at any time, and did not develop convulsions. No autopsy performed.



DR. W. L. HUTTON

Medical Officer of Health, Brantford, Ont.

PRESIDENT, ONTARIO HEALTH OFFICERS' ASSOCIATION

16th Annual Meeting in conjunction with 19th Annual Meeting of the

CANADIAN PUBLIC HEALTH ASSOCIATION

TORONTO, MAY 19th, 20th, and 21st, 1930

A New Wheat Irradiated Biscuit, Containing Vitamins and Mineral Elements*

FREDERICK F. TISDALL, M.D., T. G. H. DRAKE, M.B.,
PEARL SUMMERFELDT, M.B., and ALAN BROWN, M.B.

Toronto

IN planning a diet it is necessary to have a knowledge not only of caloric requirements and the relative amounts of fats, carbohydrates, and proteins needed but it is also necessary to have a knowledge of the importance of vitamins and mineral elements in metabolism. Before discussing a food product in biscuit form which we have devised we will briefly consider the importance of the vitamins and mineral elements. Deficiencies in these substances are the faults most frequently encountered in our modern diets.

At the present time six separate and distinct vitamins are recognized, and without doubt more will be discovered in the future. The chemical composition of all is as yet unknown. A lack of vitamin A results in deficient growth and the development of xerophthalmia. In addition, this particular deficiency produces a definite alteration in the morphology and function of many of the mucous membranes. Vitamin B has been recently divided into two separate and distinct vitamins; B₁, a lack of which causes peripheral neuritis and poor growth; and B₂ which is necessary for the prevention of pellagra and certain skin conditions. Vitamin B₂ is also necessary for normal growth. Vitamin C prevents scurvy. The antirachitic, or sunshine, vitamin D is necessary for the growth and repair of bone and other tissues. Vitamin E is essential for reproduction, and possibly certain other body changes at the age of puberty.

In addition to producing such definite clinical entities as rickets, tetany, scurvy, and the before mentioned conditions, an inadequate supply of vitamins results in a lowered resistance to infection^{1, 2, 3, 4}. We realize that there are many other food factors which influence the resistance of the body cells against disease, such as proteins and mineral elements, but it is evident that a lack of vitamins over a long period may play an important rôle in the development of many of the chronic infective conditions encountered in children and adults.

In regard to degenerative changes it had long been thought that

*From the Research Laboratories of the Hospital for Sick Children and the Sub-Department of Pediatrics, University of Toronto, under the direction of Alan Brown, M.B. Presented at the Academy of Medicine, Toronto, January 14, 1930. Published by arrangement simultaneously with and through the courtesy of the Canadian Medical Association Journal. (February).

an excess of proteins tends to produce degeneration of the heart, kidneys, and other organs. This idea is now gradually being abandoned, as carefully controlled observations have furnished no evidence in its favour. However, degenerative changes do occur in animals fed diets deficient in vitamins, and these changes are sufficient to warrant the belief that an adequate supply of vitamins may be an important factor in the prevention of degenerative changes in human beings. Recent clinical observations lend weight to this belief. Fletcher and Graham⁵ have demonstrated the remarkable effect of wheat germ with its high vitamin content in the treatment of chronic arthritis. Boyd, Drain and Nelson⁶ have shown the striking results of the administration of a combination of vitamins in the prevention of dental caries and other mouth conditions. Langstroth⁷ in a very general paper has advanced some evidence that a lack of vitamins may be associated with arthritis, hypertension, and other degenerative diseases. The importance of focal infections, however, in the production of degenerative diseases is well known, but, as animal experiments indicate that an inadequate supply of vitamins may be an important factor in the development of these foci of infection, we may conclude that many degenerative diseases may have their origin, either directly or indirectly, in an inadequate supply of vitamins.

It should be remembered that the requirements for vitamins and mineral elements vary greatly, larger amounts being necessary during childhood, and during pregnancy and lactation.

The importance of an adequate supply of the mineral elements, calcium and phosphorus, is universally recognized particularly for the growth and repair of bone and teeth. Phosphorus is fairly widely distributed, being present in large quantities in meat, eggs, whole grains, milk, and some vegetables. The supply of calcium, however, is more limited, our chief sources being milk and leafy vegetables. McCollum and Simmonds,⁸ Sherman and Hawley,⁹ and others have shown that the average diet tends to be poor in calcium unless one to two pints of milk are included daily. Although it is obvious that growing children and pregnant or lactating women require large amounts of calcium, it is not so widely recognized that the average adult diet is low in this element unless care is taken to supply it.

Iron is an essential element of the haemoglobin of the blood and of the chromatin substances within the body cells. Egg yolk has the highest iron content of any food. It is also present in appreciable amounts in liver, lean beef, many fruits and vegetables, and whole grain products. Unfortunately, white flour and finely milled cereals contain very little of this element, as the greater part of the iron is in the discarded germ and bran. Milk contains very little iron. Sherman¹⁰ found that "the typical American dietary does not contain any such surplus of iron as would justify the practice of leaving the supply of this element to chance." It is therefore essential in planning a diet,

particularly during infancy and pregnancy, to see that an adequate supply of iron is included.

As recently as one or two years ago it was thought that nine inorganic elements were all that were necessary for life. It can now be said that many others are required. One of the most important of these is copper, minute amounts of which are necessary for the formation of haemoglobin.

It is obvious that the correct method of planning a diet is first to incorporate in it the essential articles of food, and then to add the non-essential foods in order to cover the remaining caloric requirements. The chief essential foods are milk, meat, eggs, vegetables and fruit. In addition to fats and carbohydrates, these foods supply proteins, vitamins, mineral elements, and roughage. With the knowledge that the average diet, such as white flour, finely milled cereals, sugars, etc., contains an excess of the non-protective or vitamin-and-mineral-lacking foods, and realizing the necessity of an adequate supply of these elements we have devised a food product in biscuit form which contains these necessary substances in appreciable quantities. Where the ordinary biscuit, zwiebach, rusk, toast or bread are all low in proteins, lacking in vitamins, and deficient in calcium, iron, and other salts, this biscuit contains in appreciable quantities most of the food elements necessary for the growth and repair of body cells and the maintenance of resistance against disease. The biscuit has as its basis whole wheat flour, irradiated wheat germ, milk, bone meal and iron. The whole wheat is in the form of a finely ground flour. The milk is added as a milk powder.

In regard to wheat germ, which constitutes 15 per cent of the biscuit, it is well to mention here the place it occupies in the structure of a grain of wheat. Due to the present day desire for only finely milled products the germ is ordinarily discarded and not used for human consumption. The whole grain consists of three well defined structures, the bran, the endosperm, and the germ. The bran which constitutes about 13.5 per cent of the wheat acts as a protective layer for the rest of the grain. It is comparatively rich in proteins, phosphates and vitamins. The endosperm which furnishes food for the germ during growth and makes up about 85 per cent of the grain is the portion which is utilized in the manufacture of white flour and finely milled cereals. It is very poor in mineral elements and is devoid of vitamins. The germ constitutes only about 1.5 per cent of the grain and is the living part of the seed which grows and develops into the new plant. The germ contains about 8 per cent fat and 30 per cent protein. Its mineral content is about double that of the whole wheat flour and ten times that of white flour. It contains in appreciable quantities vitamins A, B₁, and B₂, and is the most concentrated source known of the reproductive vitamin E.

Before the wheat germ is used in the biscuit it is exposed to the

rays from a mercury quartz lamp. As discovered by Steenbock,¹¹ these rays activate the ergosterol normally present in the germ and thus produce the antirachitic, or sunshine, vitamin D. The whole wheat flour and germ used in our product thus contains all the known vitamins with the exception of the antiscorbutic vitamin C found in fresh orange juice. The vitamin content is further increased by the use of some butter and yeast. Butter supplies vitamin A in large quantities and yeast is a highly concentrated source of both vitamins B₁ and B₂. The yeast is not used as a leavening reagent but as a source of vitamins.

The bone meal is obtained by cooking bones in an autoclave at 267° F. for five hours. This removes all the fat. The bones are then ground and dried in an oven at 220° F. for twelve hours. The final product is an odourless and tasteless white powder. We are using this product in preference to the chemical substance calcium phosphate as there are traces of other mineral elements in the bone meal which may be of importance in the mineral metabolism of the body. The bone meal constitutes about 3 per cent of the biscuit. This means that five to six biscuits have the calcium content of one pint of milk. The iron content is about 5 mgs. iron per 100 grams of biscuit as compared to about double this amount in egg yolk, our most concentrated source of iron in food. The iron is largely obtained from the wheat germ and whole wheat. Examination of the biscuit shows the presence of copper in the concentration of about 1 mg. per 100 grams of biscuit.

In studying the vitamin D content of the biscuit it was found that a considerable amount of the vitamin D present in the irradiated germ before cooking was destroyed when the biscuit was baked at 425° F. the temperature ordinarily used in baking biscuits. It is quite possible that if the amount of vitamin D produced by irradiation is markedly

TABLE I

THE ANTIRACHITIC EFFECT OF IRRADIATION OF FOOD AND SUBSEQUENT COOKING AT DIFFERENT TEMPERATURES

	Mgm. P per 100 cc. of blood	Percentage of ash in bones
Rat on normal diet; age 8 weeks.....	6.3	57.0
Rat on Steenbock's rachitogenic diet.....	1.0	32.5
Rat on rachitogenic diet + 25 per cent of non-irradiated biscuit*....	1.1	39.0
Rat on rachitogenic diet + 25 per cent of irradiated biscuit cooked at 425° F.*.....	2.4	37.8
Rat on rachitogenic diet + 25 per cent of irradiated biscuit cooked at 300° F.*.....	3.0	48.7
Rat on rachitogenic diet + 25 per cent of irradiated whole wheat and germ in proportions used in the biscuit, uncooked*.....	3.0	46.5
Maximum antirachitic effect possible with rats on rachitogenic diet with the use of ordinary therapeutic measures.....	4.5 (about)	54.0 (about)

*76 per cent of the rachitogenic diet consists of yellow corn. The material to be tested was substituted for an equivalent amount of corn.

increased sufficient amounts for practical purposes may escape destruction at this temperature. After experimenting with different temperatures it was found that very little of the vitamin D was destroyed when



FIG. 1.—Roentgenogram of rat fed on a rachitogenic diet + 25 per cent non-irradiated biscuit. Blood phosphorus 1.1 mgm. per 100 cc., and bone ash 37.2 per cent.



FIG. 2.—Roentgenogram of rat fed on a rachitogenic diet +25 per cent irradiated biscuit cooked at 425° F. Blood phosphorus 2.4 mgm. per 100 cc. and bone ash 37.8 per cent.

the temperature of baking did not exceed 300° F. This is shown by the results in Table I and Figs. 1, 2 and 3. We estimate that the vitamin D content of ten to twelve biscuits is equal to that of one teaspoonful of standard cod liver oil.

Fig. 4 is that of a pigeon fed on a diet deficient in vitamin B₁ and B₂. After 4 weeks it developed polyneuritis, or beriberi, and died. Fig. 5 is that of another pigeon fed on the same diet, but in addition it received



FIG. 3.—Roentgenogram of rat fed on a rachitogenic diet + 25 per cent irradiated biscuit cooked at 300° F. Blood phosphorus 3.0 mgm. per 100 cc. and bone ash 48.7 per cent.



FIG. 4.—Pigeon fed on a diet deficient in vitamins B₁ and B₂. After 4 weeks it developed polyneuritis, or beriberi, and died.

15 per cent of wheat germ cooked at 300° F. for 20 minutes. After eight weeks on this diet it was apparently normal. Fig. 6 is that of two rats, the smaller one being fed for 4 weeks on a diet deficient in vitamins B₁ and B₂, and the larger rat was fed on the same diet, but in

addition received 15 per cent of the cooked wheat germ. This demonstrates that the heat conditions under which the biscuits are cooked do not entirely destroy vitamins B₁ and B₂.

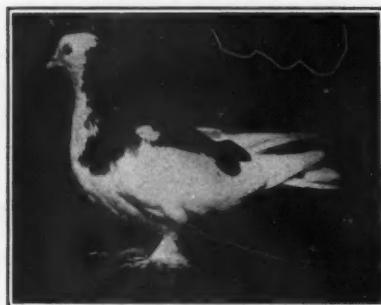


FIG. 5.—Pigeon fed on a diet deficient in vitamins B₁ and B₂ with 15 per cent of wheat germ added. The wheat germ was cooked at 300° F. for 20 minutes. After eight weeks on this diet the bird was apparently normal.

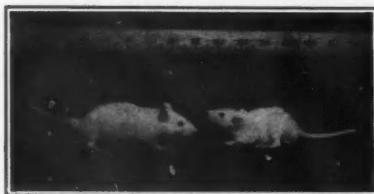


FIG. 6.—Two rats fed on a diet deficient in vitamins B₁ and B₂. The larger rat received in addition 15 per cent wheat germ cooked at 300° F. for 20 minutes.

It is the custom in the manufacture of biscuits to add certain alkaline salts as leavening agents. This produces an alkaline reaction which readily destroys vitamins B₁ and B₂ during cooking. To overcome this we have produced a biscuit with a reaction just on the acid side of neutrality through the addition of a small amount of cream of tartar. Further observations are underway to determine the exact concentration of each vitamin in the biscuit.

We would like to emphasize that no attempt should be made to supply all the vitamin requirements with this biscuit. Cod liver oil should still be administered to infants and children, to supply vitamins A and D. The diet should still be constructed around the essential articles of food, namely, milk, eggs, meat, vegetables and fruit. But when the biscuit is used in place of the ordinary biscuit, rusk, zwiebach, toast, or bread, in addition to simply supplying calories, a food will be given which will assist in the repair and growth of body cells and the maintenance of resistance against disease.

With the realization that our work is only partly completed unless this biscuit is manufactured under the conditions outlined and made available to the public, we have arranged with the McCormick Manufacturing Company to produce this biscuit under our supervision. It will shortly be available under the trade name of McCormick's Sun Wheat Biscuit.*

SUMMARY

A biscuit has been devised containing whole wheat, wheat germ, milk, butter, yeast, bone meal, iron and copper.

The wheat germ contains a large amount of vitamin E and appreciable amounts of vitamins A, B₁ and B₂. In addition it has been exposed to the rays of a mercury quartz lamp which activates the ergosterol present and thus produces the antirachitic vitamin D. Vitamin A is present in large amounts in the butter, and yeast is a concentrated source of vitamins B₁ and B₂.

The biscuit is baked under conditions which conserve the vitamin content.

Bone meal is added to supply calcium and phosphorus. Five to six biscuits contain the same amount of calcium as one pint of milk, the most important food source of this element.

The iron content is approximately one-half the concentration found in egg yolk, our highest source of iron in food. A trace of copper is also present.

The biscuit should be regarded as belonging to the essential or protective class of foods, and may be used to replace the ordinary biscuit, rusk, zwiebach, toast, or bread which are non-protective foods.

REFERENCES

- (1) Green, H. N., and Mellanby, E., *Brit. M. J.* 2: 691, Oct. 20, 1928.
- (2) Cowgill, G. R., Stucky, C. J., and Rose, W. B., *Arch. Path.* 7: 197, 1929.
- (3) Findlay, G. M., *J. Path. & Bact.* 1: 26, 1923.
- (4) Robertson, E. C., *Am. J. Hyg.* 9: 75, 1929.
- (5) Fletcher, A. A., and Graham, D., *Am. J. Med. Science* 189: 91, 1930.
- (6) Boyd, J. D., Drain, C. L., and Nelson, M. V., *Am. J. Dis Child.* 38: 721, 1929.
- (7) Langstroth, L., *J. Am. M. Ass.* 93: 1607, 1929.
- (8) McCollum, E. V., and Simmonds, N., *The Newer Knowledge of Nutrition*, New York, Macmillan Company, Third Edition, 1927.
- (9) Sherman, H. C., and Hawley, E., *J. Biol. Chem.* 53: 375, 1922.
- (10) Sherman, H. C., *Chemistry of Food and Nutrition*, New York, Macmillan Company, Third Edition, p. 342, 1928.
- (11) Steenbock, H., Black, A., *J. Biol. Chem.* 61: 405, 1924.

*The patents for the manufacture of this biscuit are held by the Research Laboratories, and all royalties accruing will be devoted to medical research.

Poliomyelitis in Ontario, 1929

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DURING the late summer and fall months of 1929 there occurred in Ontario one of the most severe and widespread epidemics of poliomyelitis ever recorded in this province. This epidemic was not altogether unexpected. Previous years had shown outbreaks reaching epidemic proportion in various of the Western Provinces. During 1926 and 1927, British Columbia and Alberta had suffered from epidemics of poliomyelitis and during 1928 Manitoba had an epidemic of 435 cases. Owing to the sweep eastward of this disease, it was considered probable that 1929 would be a poliomyelitis year in the Province of Ontario. Such proved to be the case.

The experience learned from the epidemic in Manitoba, where poliomyelitis convalescent serum was used with such marked beneficial results, led the Department of Health of Ontario to profit by this experience, and to prepare early for such an outbreak.

COLLECTION AND DISTRIBUTION OF SERUM

The Honourable Forbes Godfrey, Minister of Health of Ontario, sanctioned the collection and preparation of convalescent serum early in the year 1929. Lists of recovered cases of poliomyelitis which had occurred during the previous five years were obtained from the Department of Public Health, Toronto. Letters were sent to the parents of these children appealing for donors and explaining the method used in the collection of the blood and the benefits that might accrue to others from its use. A fairly good response resulted from this appeal. The donors were remunerated at the rate of fifteen (\$15) dollars for each blood donation. This work commenced in March, 1929. In this way, by the middle of July, over a litre of serum was available for use.

The blood was collected as follows: A 250 centrifuge bottle was fitted with a two hole stopper, and in the bottle was placed a coil of aluminum wire. This coil of wire was used to hasten the shrinkage of the clot. Through each hole of the stopper was put a piece of glass tubing, to just $\frac{1}{2}$ inch below the level of the cork in one instance and just to the orifice in the cork in the other instance. To this latter glass tubing was attached a rubber tubing of 12 inches in length, fitted with a glass mouthpiece. To the former glass tubing was attached a piece of rubber tubing of 12 inches in length, fitted with a glass window, and on the end with an adapter and a needle of 18 or 19 gauge, $1\frac{1}{2}$ inches in length. The whole outfit was wrapped in brown paper with a solid cork to fit the neck of the bottle, and steam sterilized for thirty minutes at fifteen pounds pressure. This gave an outfit which could be carried anywhere and used without subsequent sterilization. The blood was collected from a suitable vein

at the bend of the elbow by applying a tourniquet which was left in place until the collection of blood was completed. Mouth suction kept up a partial vacuum within the bottle while the blood was being drawn.

After the blood was collected the solid stopper was placed in the bottle and it was allowed to stand for several hours at room temperature and then placed in the ice chest over night.

The bottles were centrifugated and the serum separated several times in order to obtain all serum possible (approximately 50%). Tricresol was added to a percentage of 0.25; this throws down a precipitate. After filtration through paper pulp in a Buchner filter, the serum was filtered through a Berkefeld candle. The filtrate was tested for sterility and filled in 10 c.c. vials. The filled vials were again tested for sterility before the serum could be released for distribution.

The preparation and ampouling of the serum was generously undertaken by the Connaught Laboratories, University of Toronto.

After the epidemic appeared with some severity in August it was felt that the supply of serum on hand would not be sufficient. Assistance at this time was given by the Department of Public Health of Toronto, and also by the Hospital for Sick Children. The nurses of the Health Department made calls on known recovered cases of the disease, explained the urgency of the need and directed them to the Hospital for Sick Children where clinics were held for collecting the blood. The outfits as used by the Department were supplied to the hospital at this time. The recompense to donors was changed to a basis of \$5.00 for every 50 cc. with a maximum of \$20.00 for 200 cc's. Even with this assistance the supply of serum was still not adequate for future needs, and clinics were organized through the efforts of the local medical officers of health throughout the province at Hamilton, Brantford, London, St. Catharines, Niagara Falls, Kingston, Gananoque, Eganville, Cornwall, North Bay, Parry Sound, Sturgeon Falls, Sudbury, Thessalon, Sault Ste. Marie, Guelph, Kitchener, Oshawa, Sprucedale, Fort William, Port Arthur, Winchester, Arnprior, Almonte, Peterborough, Iroquois, Williamsburg, Kars and North Gower. In each instance an officer of the Department carried out the work.

The City of Ottawa, which had 176 of the cases reported, undertook the collection and preparation of serum for their own needs. This was of material assistance to the Department, in that it released for other points in the province the supply of serum which was on hand.

All of the Laboratories of the Department of Health acted as distributing centres for the serum, viz., at Ottawa, Peterborough, Kingston, Toronto, London, Sault Ste. Marie, Fort William and North Bay. As well as these centres the medical officers of health in various cities also served as distributing depots, viz., Sudbury, Niagara Falls, Fort Frances and Hamilton.

Numerous requests were received from physicians to have a supply of this serum on hand in their own offices. It was impossible to comply with these requests as much of the serum would have been wasted and the supply would have needlessly been exhausted. Physicians were urged to telegraph or telephone to their nearest distributing

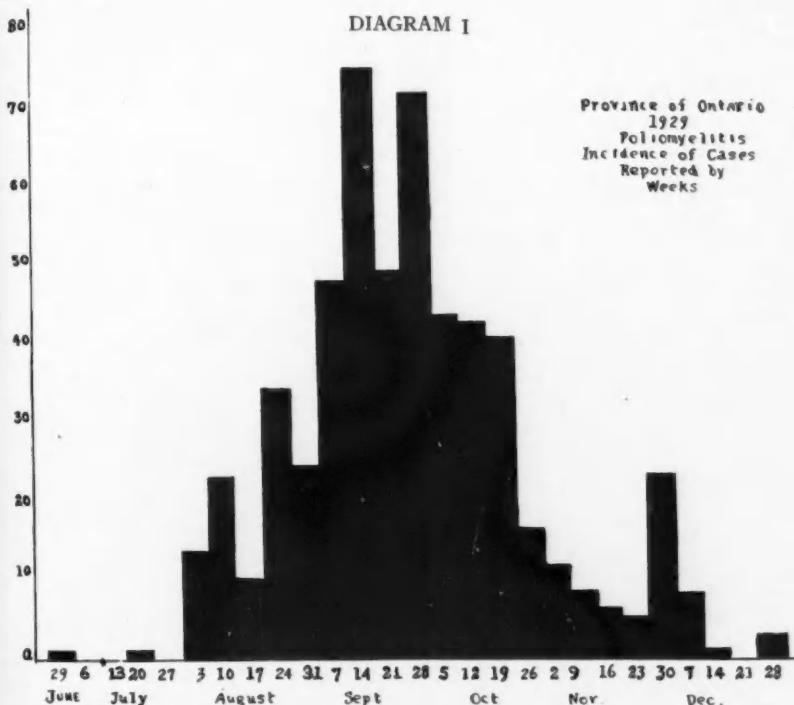
centre when a case was diagnosed; a supply of serum was then sent with the utmost possible despatch. The number of cases which were shown to have received the serum on the first day of illness bear witness to the despatch with which the serum was forwarded from the various centres.

TABLE I
PROVINCE OF ONTARIO
POLIOMYELITIS
1929
CASES AND DEATHS ACCORDING TO DATE OF REPORT

Week Ending	Cases	Deaths
June 29	1	
July 6		
July 13	2	
July 20	1	0
July 27	0	
August 3	14	
August 10	23	
August 17	10	
August 24	34	
August 31	25	
September 7	49	
September 14	75	
September 21	48	
September 28	72	9
October 5	43	
October 12	42	
October 19	40	
October 26	16	6
November 2	11	
November 9	8	
November 16	6	
November 23	5	
November 30	23	0
December 7	8	
December 14	1	
December 21	0	
December 28	3	
June 22—Dec. 28	558	26

The Department issued a circular early in August, which was sent to every practising physician in the province, indicating in succinct form the salient features in the early diagnosis of poliomyelitis, the importance of early diagnosis for treatment, and the way to obtain serum, urging the use of the telephone or telegraph.

With each package of convalescent serum was enclosed a direction sheet for the administration of the serum, and also a questionnaire form with the request that this form should be returned to the Department after completion by the physician. The manner in which the physicians responded to this request was most encouraging and it is through the co-operation of the physicians in this respect that this report was made possible.



Acknowledgment is also made of the excellent report* of the cases treated in Ottawa by Dr. T. A. Lomer, M.O.H., and Dr. W. T. Shirreff, Superintendent of Strathcona Hospital, Ottawa. This report is a study of 176 cases treated in that city, and through the generosity of the authors these cases have been included in this study of the disease as it occurred throughout the whole province. Acknowledgment is also tendered to Dr. Alan Brown, for making available the records of the cases treated at the Hospital for Sick Children, Toronto.

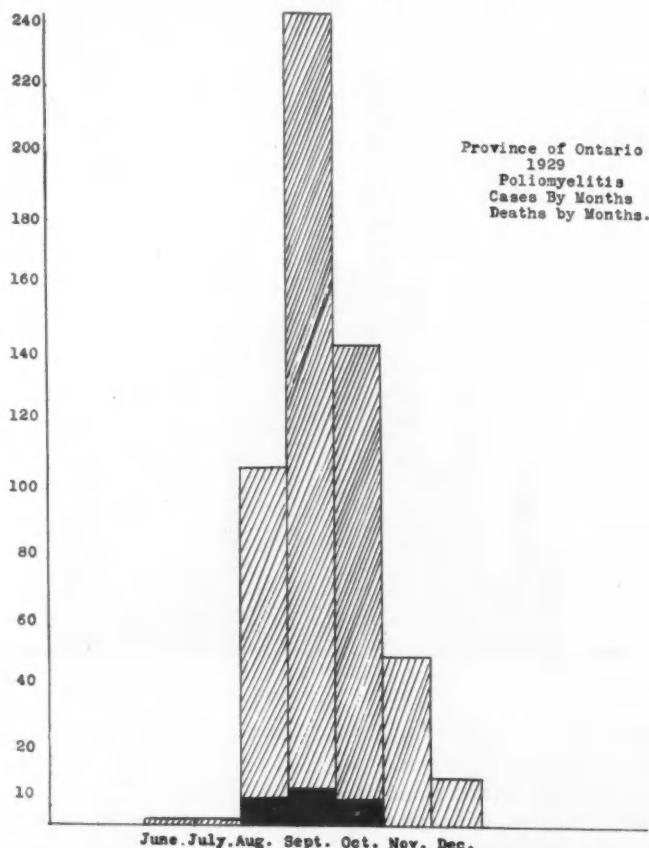
EPIDEMIOLOGICAL FINDINGS

The cases of and deaths from poliomyelitis as reported to the Department from the week ending June 29th to week ending December 28th, are shown in table I and diagrams I and II. There was a total of 558

*Pages 53-67 in this issue.

cases, being a rate of 17.3 per 100,000 population for that period or a rate of approximately 35 per 100,000 per annum. There were several early sporadic reported cases, two in January, two in June, and two reported deaths in February, one in March and two in June. With the first week in August a marked increase in cases was reported. These rose rapidly to a peak during the last three weeks of September. From

DIAGRAM II



this point the decline in cases was less rapid than had been the rise to the peak, and even during the last week in November and in December cases were still reported. The idea of temperature conditions, such as the appearance of the first frost bringing an end to the epidemic, is not borne out by these figures. The majority of cases, 369 out of 558, however, occurred from the first week in September to the third week in October. Comparing this incidence with the Manitoba experience of the previous year, although the peak occurred at approximately the

same time of the year, the epidemic in Ontario was slower in its decline and of longer duration, and more cases occurred after the peak was reached than before it. Table II exemplifies the fact that this distribution is typical of what has occurred previously in this province; for the years, 1923-1928 inclusive, the peak of the cases has occurred in September, and the decline in the number of cases has been slower than the rise to the peak number; also sporadic cases do occur throughout the year.

TABLE II
PROVINCE OF ONTARIO
POLIOMYELITIS

CASES AND PERCENTAGE DISTRIBUTION BY MONTHS FOR THE YEARS 1923 TO 1928 AND FOR 1929

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1923.....	2	2	0	4	0	0	2	0	6	0	1	2	19
1924.....	0	0	0	0	0	0	0	3	35	20	20	6	81
1925.....	2	4	1	0	5	0	4	19	37	17	3	0	92
1926.....	2	0	0	0	0	2	0	5	22	27	8	2	68
1927.....	0	0	0	0	0	0	2	3	10	21	7	6	49
1928.....	2	0	0	2	3	1	3	3	27	23	16	4	84
Total.....	8	6	1	6	8	3	11	33	137	108	55	20	393
Percentage.....	2.0	1.7	0.2	1.7	2.0	0.5	2.6	8.3	34.7	27.3	14.0	5.0	100
1929 Cases.....	2	0	0	0	0	2	1	106	244	141	53	12	561
1929 Percentage...	0.3	0	0	0	0	0.3	0.1	18.9	43.6	25.2	9.5	2.1	100

The cases, distributed by age, and the percentage each group forms, as shown in Table III, of the total, bring out a point again which has made itself manifest in the more recent epidemics, viz., that poliomyelitis is not a disease of infancy. In this series only 5.8 per cent of the total number of cases were in children under 2 years of age, and only 62.8 per cent were in children under 10 years of age. The five year age group with the highest percentage was the 5-9 year group. However, all ages up to 20 years showed a significant number of cases, so that the idea of poliomyelitis being a disease of infancy must be altered.

The total number of deaths, as shown in Table III, was 26. In the younger ages the case fatality was highest in the 0-4 age group, and higher in the 10-14 and 15-19 age group than it was in the 5-9 group, whereas the greatest number of cases occurred in this group.

The sex distribution by age of 426 cases is shown in Table IV.

Of the total number of cases studied 264 or 61.9 per cent were males, and 162 or 38.1 per cent were females. Considered in five year age groups the males attacked were in the majority in each group. This is in agreement with reports of other epidemics. No adequate explanation is offered as to why males are attacked in greater numbers than females.

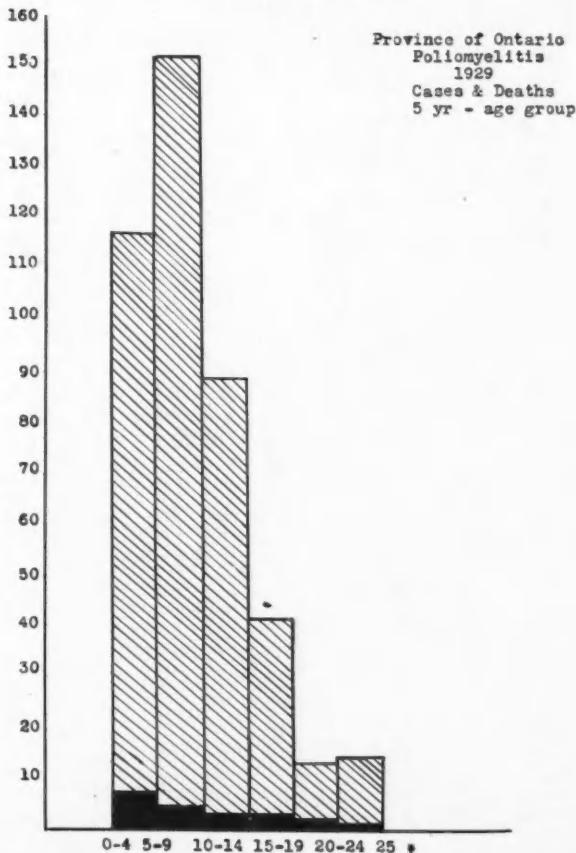
TABLE III
PROVINCE OF ONTARIO
POLIOMYELITIS, 1929
CASES AND DEATHS

CASES			DEATHS		
	Number	Percentage Distribution		Number	Percentage Distribution
0-1	4	.9		0	
1	20	4.9		3	
2	31	7.3		4	
3	31	7.3		0	
4	30	7.0		1	
0-4	116	27.4		8	30.7
5	29	6.7		0	
6	33	7.7		1	
7	26	6.0		0	
8	33	7.7		3	
9	30	7.0		1	
5-9	151	35.4		5	19.3
10	22	5.5		2	
11	18	4.0		1	
12	15	3.5		1	
13	20	4.9		0	
14	14	3.2		0	
10-14	89	20.9		4	15.3
15-19	42	10.0		4	15.3
20-24	13	3.0		3	11.6
25-49	15	3.5		2	7.8
Total	426	100.		26	100.
					6.1

The distribution by locality of the cases reported is shown in the maps. There were three counties which suffered severely from this epidemic. Carleton County, and especially the City of Ottawa with

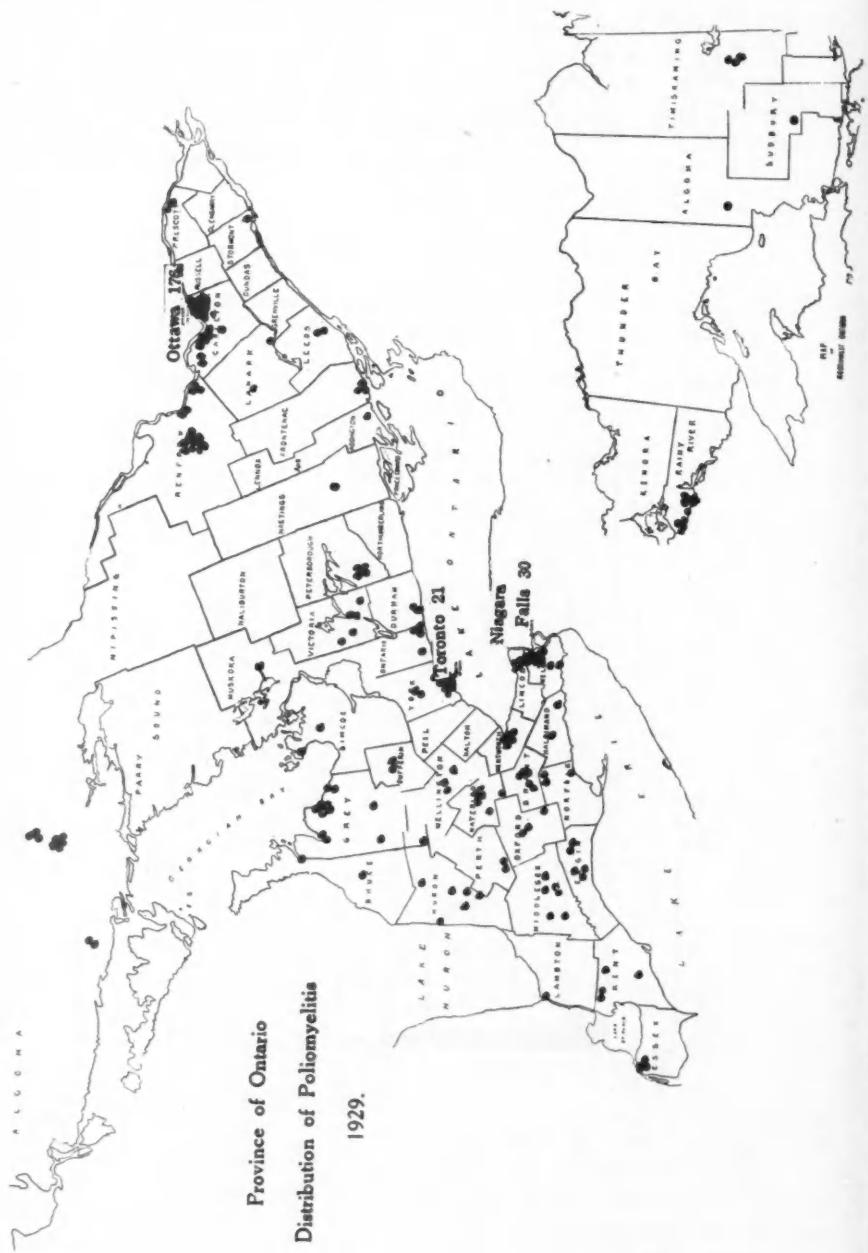
176 cases, suffered most severely. Welland County and the City of Niagara Falls and Grey County were next in order of number of cases reported. The only large area which escaped infection was that in Haliburton, Hastings, Lennox and Addington and Frontenac. No explanation can be offered as to why these counties remained practically free of the disease. The northern parts of these counties are thinly

DIAGRAM III



settled, but in another thinly settled section nearby (the County of Renfrew) there were 13 cases reported.

The distribution of the cases into rural and urban populations (urban being considered as 5000 and over) and also the division into age and sex groups are shown in Table IV. The urban incidence in this epidemic is higher than the rural with 69.6 per cent of the cases. (The distribution of the population of the Province according to the



report of the Registrar General for 1927 is rural, 53.23 per cent, and urban 46.77 per cent). The fact that 176 of the cases occurred in the City of Ottawa would account for this discrepancy. The remainder

TABLE IV
PROVINCE OF ONTARIO
POLIOMYELITIS, 1929
CASES ACCORDING TO AGE, SEX, AND RURAL AND URBAN DISTRIBUTION

Age	URBAN						RURAL										
	Male			Female			Male & Female			Male			Female			Male & Female	
	No.	%	No.	%	Total	%	No.	%	No.	%	Total	%	No.	%	No.	%	
0	2	1	1	0.8	3	.9	1	1.2	0	0	1	.8	4	.9			
1	11	5.9	6	5.3	17	5.2	2	2.4	1	2.1	3	2.3	20	4.9			
2	12	6.4	9	9.7	21	7.1	5	6.2	5	10.6	10	8.5	31	7.3			
3	14	7.8	10	8.8	24	8.1	4	4.8	3	6.4	7	5.4	31	7.3			
4	16	8.7	8	2.0	24	8.1	6	7.5	0	0	6	4.6	30	7.0			
0-4	55	29.6	34	31.5	89	29.4	18	21.9	9	19.1	27	21.6	116	27.4			
5	15	8.3	8	7.0	23	7.8	4	4.8	2	4.2	6	4.6	29	6.7			
6	13	7.1	8	7.0	21	7.5	7	8.7	5	10.6	12	9.2	33	7.7			
7	10	5.1	8	7.0	18	6.1	5	6.2	3	6.4	8	6.2	26	6.0			
8	18	10.	11	9.8	29	9.8	3	3.6	1	2.1	4	3.1	33	7.7			
9	13	7.2	7	6.8	20	6.7	7	8.7	3	6.4	10	7.7	30	7.0			
5-9	69	37.2	42	37.4	111	37.9	26	31.9	14	29.7	40	30.8	151	35.1			
10	8	4.5	8	7.0	16	5.4	3	3.6	3	6.4	6	4.8	22	5.3			
11	6	3.3	4	4.8	10	3.6	5	6.2	3	6.4	8	6.2	18	4.0			
12	9	4.9	3	2.7	12	4.	3	3.6	0	0	3	2.3	15	3.7			
13	8	4.4	6	5.5	14	4.7	1	1.2	5	10.6	6	4.6	20	4.8			
14	6	2.3	3	2.6	9	3.	2	2.4	3	6.4	5	3.8	14	3.5			
10-14	37	19.4	24	21.9	61	21.7	14	17.	14	29.7	28	21.7	89	21.4			
15-19	20	12.8	7	6.8	27	9.	11	13.8	4	8.6	15	11.5	42	9.8			
20-24	3	1.0	2	1.8	5	1.7	6	7.5	2	4.3	8	6.2	3	3.0			
25-29	1	0.5	2	1.8	3	1.	3	3.6	2	4.3	5	3.8	8	1.8			
30-34			1	0.8	1	.3	2	2.4	1	2.1	3	2.3	4	.9			
35-39							1	1.2	0	0	1	.8	1	.2			
40-44							1	1.2	0	0	1	.8	1	.2			
45-49									1	2.1	1	.8	1	.2			
	185	100	112	100	297	100	82	100	47	100	129	100	426	100			

of the cases in the Province were about equally distributed between rural and urban. It has been variously stated that poliomyelitis is a disease of the rural sections, but this is not borne out by the last two epidemics in Canada, viz., Manitoba and Ontario, where the majority of cases have occurred in the cities and larger towns. The rural cases show a higher proportion in the older age groups than do the urban cases. This is in keeping with the findings of other surveys and in this way resembles other common communicable diseases.

Symptomatology

The order of frequency of symptoms of the disease is shown in Table V and Diagram IV. The symptoms recorded in the Ottawa

TABLE V
PROVINCE OF ONTARIO
POLIOMYELITIS
1929

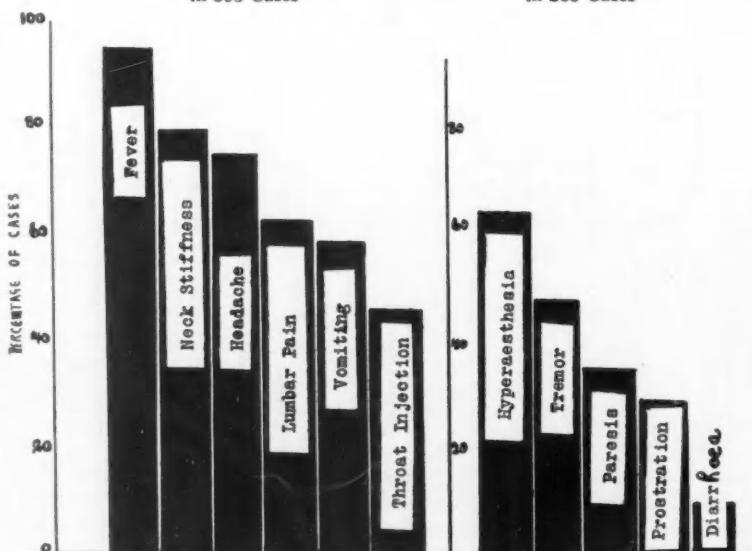
SYMPTOMS RECORDED IN 393 CASES

Symptom	Number	Percentage of Cases
Fever	371	94.9
Neck Stiffness	308	78.8
Headache	305	77.5
Lumbar Pain	296	74.5
Vomiting	234	59.5
Throat Injection	178	45.5

**ANALYSIS OF SYMPTOMS
253 CASES**

	200 CASES
Hyperesthesia	119
Tremor	76
Paresis	93
Prostration	165
Diarrhoea	30
	47.
	30.
	36.8
	64.5
	12.5

DIAGRAM IV



report were not in entirety the same as those recorded for the other cases occurring in the Province, but so far as possible, these are included in this analysis. The symptoms were fairly constant and many

diagnoses were confirmed by lumbar puncture, although the Department did not insist that lumbar puncture and a cell count should be done to confirm the diagnosis before releasing a supply of the serum; in many instances this would have been impractical and valuable time would have been lost in the early administration of the serum. However, of the cases studied 254 or 65 per cent had lumbar puncture done, and in 231 or 91 per cent of these, cell counts were made. The cell counts were as follows:

TABLE VI

CELL COUNTS OF SPINAL FLUID OF 231 CASES

Cells	No. of Cases	Per Cent
10- 25	67	29
25- 50	45	19.4
50-100	65	28.1
100+	54	23.5

RESULTS OF SERUM THERAPY

The serum was put up in 10 cc. vials, and 20 cc. was recommended as the dose for intramuscular injection. In some cases where a rise of temperature was noted after the initial fall following the first dose, a second dose of serum was given with better results. Practically all of the serum was given by the intramuscular route.

TABLE VII

PROVINCE OF ONTARIO

POLIOMYELITIS 1929

SUMMARY OF RESULTS OF SERUM TREATMENT

Total number of cases reported in Province.....	558
Total number of cases known to receive serum.....	387*
Total number of cases known to receive serum with complete recovery....	260
Recovery rate.....	67.1%
Total number cases of which were paralyzed when serum was given.....	65
Deducting these 65 cases—recovery rate.....	80.7%
Records received account for 39 cases that did not receive serum.	

The results of serum therapy, with reference to paralysis developing, and in relation to the day of illness on which the first administration of serum took place, are shown in Table VII and Diagram V. The necessity for early diagnosis and immediate administration of the serum is well exemplified. Of those cases who received the serum on the first day of illness all recovered and there were no cases of residual

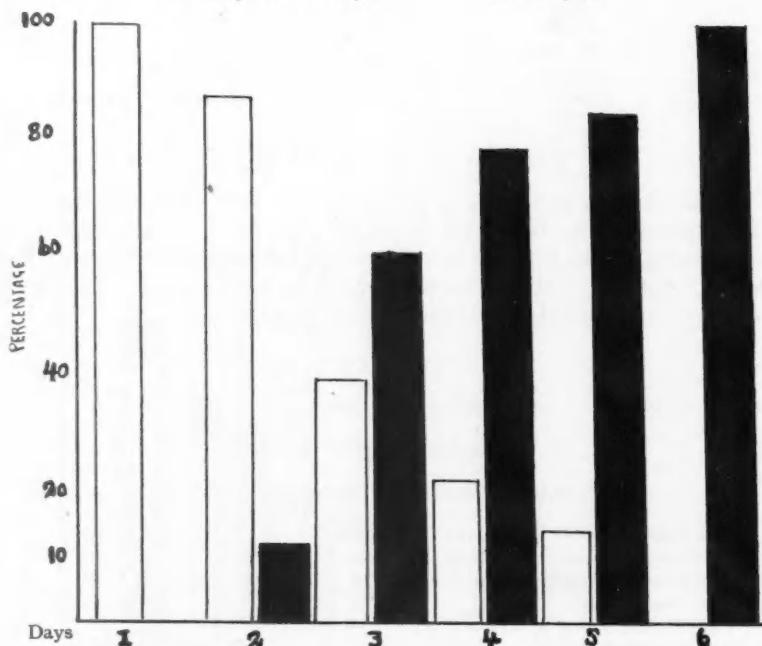
*Serum was distributed to all cases reported and undoubtedly used in the vast majority though no report of its use has been returned to date in 132 cases.

paralysis. Even on the second day of illness 87.7 per cent completely recovered without paralysis, but with each succeeding day the percentage of recovery without paralysis became smaller and smaller until in those receiving it on the sixth day, 100 per cent remained paralyzed.

The record of 39 cases who did not receive serum therapy is shown in Table VIII. Four of these cases recovered without paralysis and 35 were left with some residual paralysis.

No attempt was made to analyze the extent of resulting paralysis

DIAGRAM V
PROVINCE OF ONTARIO
POLIOMYELITIS, 1929
RESULTS OF SERUM ADMINISTRATION ON VARIOUS DAYS AFTER ONSET
□ Complete Recovery. ■ Paralysis.



in any of these cases. There were several hundred physicians who treated these cases, and reports were usually sent in within a few weeks of administration of the serum, so that no definite estimate of the extent of permanent residual paralysis was possible.

No attempt was made to trace the source of infection or mode of transmission, except to establish, where possible, contact with known or suspected cases of poliomyelitis. The only information requested on the data sheet was the age and sex of the household contacts, and record of known exposure to a case of poliomyelitis outside of the household.

TABLE VIII
PROVINCE OF ONTARIO
POLIOMYELITIS, 1929
RESULTS IN 39 CASES WHICH DID NOT RECEIVE SERUM

Day of Illness Seen	Number of Cases	Number Showing Paralysis	Number Not Showing Then Or Later, Any Paralysis
First Day	6	3	3
Second Day	9	8	1
Third Day	15	15	0
Fourth Day	7	7	0
Fifth Day	1	1	0
Sixth Day	1	1	0
Total	39	35	4

SECONDARY CASES

There were twenty-six secondary cases reported. The period of incubation in over 70 percent of the cases was within 5-10 days after exposure as shown in Table IX.

TABLE IX
PROVINCE OF ONTARIO
1929
SECONDARY CASES POLIOMYELITIS OCCURRING AT VARIOUS INTERVALS AFTER PRIMARY CASES

Interval by Days	5	6	7	8	9	10	11	12	13	14	21
Cases—Total 26	3	4	4	2	3	5	2	1	0	1	1

Twenty-four of the twenty-six secondary cases occurred in rural areas. The secondary attack rate like the primary rate was highest in the 5-9 age group. In many instances children under three years were exposed to a primary case, and in some instances, even to a secondary case without contracting the disease, while older age groups contracted the disease. It could be quite possible that these exposed children had abortive unrecognized attacks. Other cases developed in

families where mild attacks of "colds" were noticed prior to the development of the primary case. In some instances a low grade temperature had been observed previous to the recognized primary case. Cases also occurred in isolated districts where no history of previous illness had occurred, where the cases and other exposed persons (children) had not been off the farm all summer, and contact with the outside was possible only through adults, who gave no history of known exposure or illness.

SUMMARY

The lessons from the study of this epidemic and the control measures used would seem to be as follows:

1. The use of convalescent poliomyelitis serum in the treatment of the disease, especially in the pre-paralytic stage, would seem to be a rational measure attended with a high percentage of complete recovery.
 2. Our experience is in agreement with that of the Manitoba group, namely, that the use of this serum by the intramuscular route gives results comparable with its use as reported previously by the intrathecal route, and lends itself to cases which are widely scattered where no hospital facilities are immediately available.
 3. It is quite feasible with proper co-operation to secure and maintain a supply of serum sufficient for an epidemic of over 500 cases.
 4. A supply of serum should be obtained and held in readiness months before the appearance of an epidemic. It is more difficult to obtain donors at this time before public interest is aroused through press articles on the occurrence of the disease in epidemic form, but this supply is essential for the treatment of the early cases.
 5. It is quite feasible to supply a province the size of Ontario with serum readily available, if a sufficient number of distributing centres, strategically placed, are used for its distribution.
 6. Poliomyelitis is not a disease of infancy, but most frequently occurs in children of school age.
 7. The early diagnosis and early administration of the serum before paralysis is evident are essential for the best results from the use of the serum.
 8. A sufficient number of secondary cases occur in households within 5-10 days after the primary case to warrant the incubation period and therefore quarantine being considered at least as long as 10 days.
-

Tularemia

THE FIRST CASE REPORTED IN CANADA

DR. A. L. McNABB,

Director of Laboratories, Department of Health of Ontario

DURING the year 1929, 907 whole blood specimens were submitted to the central laboratory of the Department of Health, Ontario, for agglutination of *B. typhosis*. The agglutination for *B. typhosis* was supplemented by a set-up of each specimen for para *A.*, para *B.*, *B. abortus* and *B. tularensis*. The first specimen positive for *B. tularensis* was found after examining 909 specimens. This serum was sent by Dr. L. Hudson, of Timmins, for our regular routine agglutination test.

Complete agglutination was present in this specimen in the 20, 40 and 80 dilution. A repeat test gave the same result. A second specimen was asked for and this specimen was found to agglutinate *B. tularensis* in a dilution of 1/160. There was no cross agglutination for typhoid, paratyphoid, *B. abortus* or *B. melitensis*. An absorption test was done and it was found that a suspension of *B. tularensis* completely absorbed the agglutinins present in the patient's serum. A small amount of serum was sent to Dr. Edward Francis of the United States Public Health Service and he confirmed the result by agglutination and absorption tests for which the writer wishes to express his appreciation.

ABSTRACT OF CASE HISTORY

The history of the case, kindly supplied by Dr. Hudson on January 9th, 1930, is abstracted below:

Immediate History

The patient, a miner 34 years of age, gave a history of sudden pain in the right upper quadrant appearing on December 11th, 1929. This disappeared over night and patient was free from symptoms for four days. On the fifth day the pain returned and was accompanied by fever. The patient was in bed for ten days before being seen by the physician on December 29th, 1929. He now complained of malaise and pain in the upper right quadrant.

Examination

Well nourished, but looks ill; sclera slightly yellow. R—22; P—90; T—100°F.; slight tenderness with slight rigidity over gall bladder area. Findings otherwise irrelevant.

Subsequently there were chills every other day with sweating following, the temperature rising to 100°F. to 103°F. On January 9th, condition unchanged.

On subsequent questioning he recalled skinning and dressing two wild rabbits but gave no history of pricking fingers or having sores or glandular involvement.

As this is the first case in Canada it was thought advisable briefly to review our present knowledge of this disease. In 1911, McCoy described a plague-like disease in ground squirrels in California. In 1912, McCoy and Chapin discovered the causative agent and called it *Bacterium tularensis*, after Tulare County, California, as their isolations had been mostly made from animals found in that county. In 1911, Pearce described the condition as a result of insect bites. There were six human cases in Utah. The condition there was commonly known as deer fly fever. In 1914, Vail, Wherry and Lamb, of Cincinnati reported a *B. tularensis* infection of the eye. This was the first case in man to receive bacteriological confirmation by the isolation of the organism. Francis, in 1919-20, while in Utah recognized the similarity between the plague-like disease of rodents and the so-called deer fly fever in man. He called the condition "tularemia," after isolating *B. tularensis* from the blood of several patients.

Distribution and transmission

In the United States, the organism has been isolated from ground squirrels, rabbits, hares, sheep, musk-rats and quails; also there have been a few isolations recorded in wild rats and mice and one infection was attributed to the bite of a coyote. The infection may be transmitted to man by the bite of the horsefly (*Chrysops discalis*), and the bite of the wood tick (*Dermacentor andersoni* Stiles). but the usual transfer of the infection is by contamination of the hands or conjunctival sac with portions of the internal organs or infected body fluids of infected animals.

Bacteriology

B. tularensis is a small aerobic, pleomorphic organism, gram-negative, non-motile, non-sporulated. The optimum growth temperature is 37°C. The optimum pH. range in media is pH. 6.8 to pH. 7. It produces acid but not gas in glucose, levulose, mannose, glycerine. The best growth is obtained on blood-glucose-cysteine agar. 56° to 58°C. kills the organism in ten minutes; 0.1% formaldehyde renders the organism harmless in twenty-four hours. Pure undiluted glycerine preserves the virulence of the organism in an infected tissue for one month. The organism has been found to survive in frozen rabbits for three weeks.

Isolation of the Organism

During the early stages of the disease the organism may be isolated from the blood. This is done most conveniently by inoculation of the guinea pig, intraperitoneally with defibrinated blood diluted with normal saline. The organism may be recovered from the liver and spleen of the guinea pig at autopsy.

Agglutination Test

During the first week of the disease there is no agglutination present in the patient's serum. A positive agglutination may be obtained in the second week of the disease. The titre rises in the third week and the maximum titre is reached around the sixth and seventh week. In the routine agglutination test in the central laboratory, serum saline dilutions are made in 1/5 to 1/320. 0.5cc. of serum saline solution is placed in each tube. To each, 0.5 cc. of antigen is added. The tests are placed in the water bath for four hours then removed to the ice-box overnight. If cross-agglutination should be found present in the set-up for *B. abortus*, the specimen should be submitted to the absorption test.

Prevention

No preventive serum or vaccine has been found satisfactory, nor any special drug. Rabbit meat when cooked to 133°F. is harmless. Rubber gloves should be worn by those dressing rabbits.

Conclusions

As there is no special preventive treatment or vaccine for tularemia, workers dressing wild rabbits should wear rubber gloves. All specimens of blood submitted for typhoid agglutination to public health laboratories should also be set up against para A. and B., *B. abortus* and *B. tularensis* organisms.

Editorials

POLIOMYELITIS

THE virus of poliomyelitis appears, from epidemiological observations, to be widely disseminated among the population and sets up a widespread immunity to the disease. Clinically, there are the recognized cases with an onset of fever, meningeal involvement as evidenced by stiffness of the neck muscles, followed by paralysis on the 3rd or 4th day; there are the so-called "bulbar" cases in which paralysis appears with the onset of the febrile symptoms; there are the non-paralytic cases in which there occurs the febrile state with evidences of meningeal involvement; and finally, there are cases with fever but no meningeal symptoms, and which may best be considered as suspect abortive cases. That cases without paralysis must be considered as actual infections with the virus has been established beyond question of doubt. The working hypothesis of to-day is, therefore, based on this conception that only a very small percentage of those exposed to the disease and probably infected develop any clinical evidence of infection, even a mild febrile reaction with or without meningeal irritation, and only an exceedingly small number of those infected show evidence of invasion of the central nervous system with paralysis.

Among the many questions which remain unanswered is the problem presented by the higher incidence in the summer season. Where does the virus maintain itself in the inter-epidemic periods, when only an occasional sporadic case is reported? Where is the reservoir of infection during the winter and spring? No evidence has been found of chronic carriers. What is the infective period in poliomyelitis? What is the incubation period? These problems await solution but if satisfactory answers cannot be given to these and other equally important questions, encouragement is found in the results of the use of immune or convalescent serum in the early treatment of cases.

In considering similar results to those reported in this issue of the Journal, Aycock has raised and answered the question as to whether we may be unfairly weighting our results by including in the treated cases many cases of the type with or without meningeal involvement which in the normal course would not have gone on to paralysis. By a careful study of the treated and untreated cases in Massachusetts involving a house to house survey, he has brought forth ample proof that the strikingly beneficial results of serum treatment are not to be explained by any such chance selection of such a group. The experience in Manitoba and in Ottawa, and the general experience in other parts

of Ontario with the use of convalescent or immune serum, will occupy an outstanding place in the evaluation of this therapeutic measure.

Having established the value of convalescent serum in early treatment as a practical measure, the question naturally follows as to the supply of serum. To be adequately prepared requires that a permanent organization for serum collection be maintained by our provincial departments.

ABSTRACTS OF CURRENT PUBLIC HEALTH LITERATURE

AT the time of its establishment, there was a very definite feeling that the Federal Department of Health would serve a useful purpose in co-ordinating provincial experience, and in giving leadership to all health measures which were nation wide in scope. This feeling has been more than justified. Under the leadership of the present Minister, his predecessors and the administrative staff of the Department, very much has been accomplished. One of the contributions which has received too little of public commendation is the monthly publication of a review of current health literature. Beginning as an eight page leaflet, dealing with the subject of venereal disease and its control, some six years ago, it has expanded to a publication varying in size from forty-four to sixty-four pages, covering all of the many phases of public health effort.

The publication is bilingual in character, and the material presented are abstracts of Canadian, English, American and Continental articles. The magnitude of the task assumed by the Department may be gathered by the fact that, during the year just concluded, some 680 articles were abstracted—158 of the references appearing in French, with the balance in English. The material is divided under appropriate headings; for example—160 articles were classed as coming under the heading of public health and laboratory investigations; 43 dealt with mental hygiene; 65 with venereal disease; 75 with industrial hygiene; 64 with child health; 71 with some phase of sanitary engineering; 147 with physiological chemistry; 20 with narcotism and 18 with proprietary or patent medicines.

This gratuitous distribution of synopses of the latest expression of public health and medical opinion, to all of the physicians in Canada, must, of necessity, be a stimulus to the busy urban physician; and serves, also, the rural practitioner, who, equally busy, is often, despite the advent of measures to lessen his isolation, too far removed from the medical centres to continuously receive the latest thought in preventive medicine.

The gratitude of the profession, particularly those primarily interested in some phase of public health, is due to the Department of Pensions and National Health, for this meritorious publication.

ONTARIO HEALTH OFFICERS'

16th ANNUAL CONFERENCE

CANADIAN PUBLIC HEALTH ASSOCIATION

19th ANNUAL MEETING

MAY 19, 20, 21, 1929

The Ontario Health Officers' Association is composed of the Medical Officers of Health of the eight hundred and fifty municipalities in Ontario. The history of the organization dates back to 1912, and covers a period of important development in the field of public health in Ontario.

In order to facilitate the attendance of the Medical Officer of Health at

and shall be payable, in addition to his salary, on the certificate of the Deputy Minister.

The Annual Conference is held regularly in Toronto. The members will have an opportunity this year to attend the general sessions of the Canadian Public Health Association in the afternoons, in addition to the morning sessions which will be de-



HART HOUSE THEATRE, UNIVERSITY OF TORONTO,
IN WHICH THE GENERAL SESSIONS WILL BE HELD.

the Annual Conference, the Public Health Act was amended to make statutory provision for this item in his programme of official activity. Section 41 provides for the holding of the Conference and states that it is the duty of the medical officer to attend; continuing, it specifies that his expenses in this connection shall be borne by the corporation of the municipality,

voted to consideration of their own particular problems in the field of health administration. Special efforts have been made to provide ample opportunity for discussion of programmes designed for the various types of community over the health of which the members of the Association preside.

CHILD HYGIENE

W. T. B. MITCHELL, M.D., AND J. T. PHAIR, M.B., D.P.H.

PHYSICAL EXAMINATION PREVIOUS TO ENTERING SCHOOL

HAROLD WHITE, M.D., D.P.H.

Chief School Medical Officer—Vancouver

DURING the month of June, 1928, the Medical Department of Vancouver School Board undertook to examine as many as possible of the children who were expected to enter school for the first time in the following September.

In previous years, when all beginners had been examined in the autumn, it had been found that many parents put off the correction of defects, and immunization, until the next summer vacation. By making the examinations in June, not only were the parents afforded an opportunity to have the corrections made before the opening of school, but also much valuable autumn time was saved by the medical officer.

The names of prospective pupils were found by various means—by nurses' enquiries on their regular visiting rounds, by interrogating all school children in their classrooms, and by notices in the public press. A written invitation was sent to the parents to come and bring the child on a certain morning or afternoon. As none of these children were familiar with the school, it was necessary that they should be escorted by one of the parents. This led to a greater opportunity for personal interviews concerning personal hygiene and immunization of the children, as nearly all were accompanied by their parents, instead of the usual 50 per cent.

A team, consisting of the School Medical Officer, a school dentist and

three school nurses worked together. The nurse in charge of the district received the parents, recorded the name, age, height, weight, and personal history of each child, on his regular medical card, and passed him on to the dental room.

The dentist, besides making the examination, explained to the parent the development of the teeth, and urged necessary treatment by the family dentist during the summer—or free treatment by the school dentists during July. The assisting nurse entered the record on the child's card and passed him on to the medical examination room.

The nurse assisting the medical officer, removed the clothing to the waist, and the medical officer made the usual complete examination and discussed with the parent the physical condition of the child. The parents of the first three or four children examined were asked to wait until as many others had gathered, and then the medical officer gave a ten or fifteen minute talk to the group of parents on immunization and the general care of school children. It was found that by explaining immunization to parents in groups, much unnecessary argument was eliminated; also that parents were more open to reason before the children had been admitted to school. The parents were finally sent back to the nurse of the district, who impressed upon them the necessity for carrying out the recommendations of the medical ex-

aminer and dentist, either privately or, when necessary, at the free clinics.

At this first annual June session, 405 children were examined and 225 defects found, 40.8 per cent of which had been corrected before the opening of school in September.

In June, 1929, the same system was carried on with certain modifications rendered necessary by the amalgamation of the three school systems comprised in Greater Vancouver. This pre-school examination has proved a success and in future will be used to full advantage.

NATIONAL VOLUNTARY HEALTH AGENCIES

RUBY E. HAMILTON, Reg.N.

CANADIAN TUBERCULOSIS NURSES' COMMITTEE

THIS special group of nurses in Canada was formed in Montreal on the afternoon of the International Conference following the luncheon given to seven hundred nurses, registered as engaged in the field of tuberculosis.

The aims of the committee formed at the meeting arranged by Miss Edna Moore of the staff of the Canadian Tuberculosis Association are five in number:—

1. To keep nurses doing tuberculosis work informed on the progress made in knowledge and methods against tuberculosis.
2. To keep all nurses in the tuberculosis group in touch with each other.
3. To educate the profession and the body politic with regard to tuberculosis.
4. To study and promote the progress of affiliation between the sanatoria and training schools for nurses.
5. To advocate that all nurses should have experience with, and special instruction in tuberculosis, before graduation.

The officers appointed are: Chairman, Miss E. MacPherson Dickson;

vice-chairman, Miss M. Montgomery, and secretary-treasurer, Miss E. L. Moore.

The office work will be carried on at the office of the Canadian Tuberculosis Association and will be financed by this office.

The committee will carry on its work by utilizing a page in the nursing journal; sending multigraph extracts to members; correspondence; holding a conference at the time of the Canadian Nurses' Association meetings and provincial conferences concurrently with the provincial meetings.

The names of the nurses present and the tuberculosis work with which they are associated, follow:—

Miss Gillan, Red Cross Society, Charlottetown; Miss Coleman, St. John County Hospital, St. John; Misses Hegan and Brophy, Anti-Tuberculosis League, St. John; Miss McCort, Maritime Tuberculosis Educational Committee, Moncton; Miss E. Lefebvre, Anti-Tuberculosis Dispensary, Valleyfield; Misses Forrest and Kidd, Queen Alexandra Sanatorium, London; Miss Campion, City Health Department, Bramford; Misses Cameron and West, Mountain Sanatorium, Hamilton; Miss Hoy, Border Cities Board of Health, Windsor; Miss Cheal, Calydor Sanatorium; Gravenhurst; Miss Bingeman, Freeport Sanatorium, Kitchener; Misses

Stewart and Walker, Royal Ottawa Sanatorium, Ottawa; Miss Moore, Canadian Tuberculosis Association, Ottawa; Miss Wells and Miss Vidal, Department of Health, Winnipeg; Miss Houston, Manitoba Sanatorium, Ninette; Two Sisters from St. Boniface Hospital; Miss Torr, Department of Pensions and National Health, Toronto; Miss Flett, Ste. Agathe des Monts; Miss Montgomery, Fort Qu'Appelle Sanatorium, Fort San; Miss Davidson, University Clinic, Edmonton; and Miss Buss, St. Catharines Consumptive Sanatorium.

VISIT OF MRS. MAYNARD CARTER

MRS. CARTER, *Chief of the Division of Nursing of the League of Red Cross Societies*, during her recent visit to Canada as representative of the League of Red Cross Societies to the International Congress of Nurses, made a thorough survey of Red Cross Outpost Hospital work in Canada. She personally inspected three of the Outposts in Ontario at Whitney, Redditt and Quibell, which had been suggested as representative centres for the 44 districts in Canada now benefiting from this service. At these places, she discussed nursing

problems arising on the frontiers, with the hospital boards and with the nurses themselves.

This was a new experience for Mrs. Carter and, in her own words, she remarked enthusiastically, "This work has thrilled me." She further mentioned that, in her travels all over the world, she had only found one other country, namely Finland, carrying on this type of work, and that Finland had received its inspiration in this regard from Canada.

Probably the most interesting aspect of Mrs. Carter's visit was the "close-up," intimate view she gave of the vastness and advancement of Red Cross activities all over the world and how we, in Canada, are so closely linked up with this world-wide endeavour. She showed how the League, by financial assistance and its training centres, had not only raised the standard of nursing in a number of countries, but had actually been the means in some cases of starting national centres of training, where before there had been none.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA* BY PROVINCES—DECEMBER, 1929

Disease	P.E.I.	Nova Scotia†	New Bruns	Quebec	Ontario	Mani-toba	Saskat-chewan	Alberta	British Columbia
Diphtheria....	7	20	13	252	267	56	47	21	110
Scarlet Fever..	—	97	63	456	585	58	90	148	101
Measles.....	—	—	49	590	384	6	46	5	214
Whooping Cough.....	—	2	—	401	283	73	125	34	90
German Measles.....	—	—	—	19	73	†	1	1	1
Mumps.....	—	—	5	286	113	95	30	75	194
Smallpox.....	—	—	—	10	55	14	113	25	15
Cerebrospinal Meningitis..	—	—	—	3	4	1	1	3	4
Anterior Poliomyelitis	—	—	—	2	6	—	—	2	1
Typhoid Fever]	2	—	4	30	23	2	6	6	13

*Data furnished by the Dominion Bureau of Statistics, Ottawa.

†Not reportable.

‡Week ending December 4th not yet received.

NEWS AND COMMENTS

P. A. T. SNEATH, M.D., D.P.H.

THE Canadian Medical Association has sponsored short talks on medical subjects of public interest over the Trans-Canada broadcasting network of the Canadian National Railways. On Tuesday, January 21 last, Dr. A. Grant Fleming, Professor of Public Health and Hygiene at McGill University spoke on the common cold.

Old Age Pensions

TO the end of the calendar year of 1929 \$5,002,277 has been expended in the payment of Old Age Pensions in Canada, one-half of which was paid by the Dominion Government. The distribution of this outlay was made as follows: British Columbia, \$1,777,956; Alberta, \$125,110; Saskatchewan, \$1,048,658; Manitoba, \$1,338,894; North West Territories, \$251; and Ontario, \$711,657.

Health Heroes

WE would call the attention of our readers to a most interesting series of booklets known as "Health Heroes", published by the School Advisory Bureau of the Metropolitan Life Insurance Company, the headquarters of which are in Ottawa. The series so far covers the lives of Florence Nightingale, Louis Pasteur, Walter Reed and Edward L. Trudeau. These are reviewed elsewhere in this issue.

Nova Scotia

PREMIER RHODES has announced his intention of introducing an Old Age Pensions Bill at the next

session of the Legislature. Also it is his intention to provide for Mothers' Allowances, and a Women's Minimum Wage Board. The funds for these new items of social legislation are expected to be drawn from the increased tourist traffic, the government control of liquor sales, and a re-adjustment of government grants and subsidies.

New Brunswick

MISS H. S. DYKEMAN, Director of Public Health Nursing in this province, was amongst those attending the combined voluntary agencies conference in Ottawa, November 23-30, 1929. Miss Dykeman's interests were occupied in the following: Conference on Crippled Children's Problems; Conference on Voluntary Agencies; The Council on Immigration of Women; and The Annual Meeting of the Council on Child Welfare.

We regret very much to learn of the sudden death of Dr. D. V. Landry, District Medical Officer of Health for the Northern District of New Brunswick, a notice of which is to be found elsewhere in this issue.

Quebec

THE Kamouraska—L'Islet County Health Unit commenced its activities December 20th last. Dr. Chas. H. Dumais, D.P.H., who is the District Health Officer, has been placed in charge of this unit until further arrangements are completed. He is assisted by a staff consisting of three

nurses, a sanitary inspector who is also a veterinarian, and a clerk.

The staff of the units of Lotbinière and Matane counties have commenced training at the Beauce County Unit where the instructional centre is maintained. It is expected that these two units will become active by Easter.

The counties of Lévis and Metapedia have voted the necessary funds for the establishment of a county health unit in their respective areas.

The annual meeting of the personnel of the various county units was held at the Parliament Buildings in the City of Quebec, the personnel of thirteen units being in attendance.

Travelling anti-tuberculosis clinics now being a part of the established policy of the Bureau of Public Health, Dr. Laboeuf is conducting such a clinic covering the counties of Lake St. John, Chicoutimi, Nicolet, and Mégantic. Dr. Fontaine is at present in training at the Lake Edward Sanitarium prior to taking charge of a similar clinic covering the area administered by other health units. It is anticipated that eventually such clinics will serve all the county health units, the medical officer conducting such being assisted by a staff of nurses.

The county health units have enlarged their service by undertaking the tuberculin testing of cattle under the charge of a veterinarian.

The Montreal Chemical and Bacteriological Laboratory, under the direction of Mr. MacHarvey McCrady, has recently increased its activities fol-

lowing the complete re-arrangement and repair of its quarters.

Ontario

At the first meeting of the Toronto Board of Health for the year 1930, Alderman W. Wadsworth was elected chairman.

Dr. F. S. Ruttan, Medical Officer of Health of Woodstock, reports that during the year 1929, there has not been a single case of diphtheria in the municipality. Last spring the medical men of the city and local board of health co-operated in the inoculation of the pre-school and school age children with diphtheria toxoid, 199 of the former group having completed the series and 524 of the latter. It is proposed during the present year (1930) to continue this campaign of immunization of children.

The 1929 report of the Medical Officer of Health of Brantford, Dr. W. L. Hutton, notes that this city has been remarkably free from diphtheria. There have been fourteen deaths during the past year of children who had not been immunized against the disease, and not a single death amongst those who had had preventive inoculation. This city was one of the earliest in the Dominion to authorize the preventive inoculation of its school children with diphtheria toxoid, and has up to the end of the calendar year immunized some 8,000 school children. In 1928 the local authorities sanctioned diphtheria toxoid immunization being provided for the pre-school children of the city. The report notes that 647 have been so treated.

Saskatchewan

THE Department of Public Health is being re-organized under the direction of the Minister, the Hon. Dr. F. D. Munroe. Dr. F. C. Middleton has been appointed Deputy Minister; Dr. R. O. Davison, Director of Cancer Service; and Miss Ruby Simpson, Director of Nursing Services.

A Mental Hygiene Commission has been appointed composed of the following members: Dr. C. M. Hincks, Toronto, Chairman; Dr. S. R. Laycock, Saskatoon, and Dr. O. E. Rothwell, Regina. It is the intention of the Commission to study the problems of mental deficiency throughout the province commencing with those children now under treatment at the Weyburn Mental Hospital. It has been stated that many of the patients now in provincial hospitals are subject to deportation; this problem is also to be considered.

Consideration is to be given to a resolution recently presented to the Minister, that the standardization and supervision of the curriculum for nurses under training in the larger hospitals should be undertaken by the Province as a branch of the educational system; hospitals so controlled, it is suggested, should be given extra grants to cover the extra expenses entailed by this scheme. Further, it was suggested that since the annual cost of training a pupil nurse was about \$1,200, the other smaller hospitals established with government aid could be administered at a lower cost if staffed by graduate nurses alone.

The delegation that recently met the Minister asked that the Hospital

Act be amended. It is now compulsory to accept patients from the unorganized districts of the Province in order to be eligible for the government grant of fifty cents per diem per patient. Since many of these patients did not or could not pay their hospital expenses, and the means of collection from the Government on this score were somewhat awkward, it was felt that the hospitals should be afforded some protection against this contingency when accommodation for local patients tended to be as limited as it now is. Finally, a request was made that the government dietitian be supported entirely at the expense of the Department, in lieu of the present system by which local hospital authorities availing themselves of the service are obligated to repay to the Government the salary but not the travelling expenses of the dietitian. The reason put forward for this change was that under the present arrangement the service rendered by the dietitian was made available only on the voluntary assumption of repayment by the hospital authorities, whereas if the expenses were assumed entirely by government, the advantages of this would be open to all, benefitting particularly those hospitals most in need of this service.

Alberta

IT is generally recognized that the western provinces of this Dominion are becoming more and more interested in the government provision of medical services, which in brief is spoken of as State Medicine. At the annual convention of the United Farmers of Alberta at Calgary, the Minister of Health for that province predicted the early full establishment

of State Medicine in Alberta. The Minister admitted that the travelling health clinics already operating in the province, and for which the convention had requested a widened field of operation, are the commencement of the socialization of medical practice.

Since 1924 the government travelling clinics have served 24,000 school

children, and have performed 4,054 operations for tonsils and adenoids without any mishap. The United Farmers have requested that this service should be enlarged to provide the free medical examination annually of every school child in the rural districts.

OBITUARY

DR. D. V. LANDRY

AN outstanding figure in the medical and political life of New Brunswick passed with the sudden death from apoplexy of Dr. D. V. Landry, Medical Officer of Health for the Northern District of his native province. Dr. Landry collapsed suddenly in the Court House at Bathurst the evening of December 18th last, just prior to a meeting of the Board of Health and had expired by the time medical assistance was available.

Dr. Landry, an Acadian, was born in 1866 at Memramcook, the son of Vital J. Landry and Matilda D. Cormier, the third child of a family of fifteen. He was educated at the public school and St. Joseph's University in Memramcook, from the latter of which he received his bachelor's degree in Arts.

Commencing his public career in 1899, Dr. Landry served for a year as the representative of the parish of Wellington in the Kent County Municipal Council. In 1908, he represented Kent County in the Provincial Legislature holding the office of Commissioner of Agriculture in the Hazen

administration until he became Provincial Secretary-Treasurer in the Cabinet of the Hon. J. K. Fleming. Dr. Landry continued in this important post until the defeat of the ministry of the Hon. J. A. Murray in April, 1917. He ran for his home county in the last Provincial election but was defeated by the Hon. A. A. Dysart, Leader of the Liberal party in New Brunswick. He was considered one of the most able and fluent platform speakers in the Province having complete command of both French and English.

For some years he had been suffering an impairment in his health and in March, 1927, it was thought that his life would be prolonged with his retirement from general practice and the assumption of the less strenuous duties of District Medical Officer of Health of the newly created Northern District comprising the counties of Madawaska, Gloucester and Restigouche. However, this unfortunately was not to be.

Dr. Landry is survived by his wife and seven children to whom we tender our sincere sympathy.

BOOK REVIEWS

D. T. FRASER, B.A., M.B., D.P.H. and R. R. McCLENAHAN, B.A., M.B., D.P.H.*

Diseases Transmitted from Animals to Man—*By Thomas G. Hull. Charles C. Thomas, Publisher, Springfield, Ill., 1930. xxiv+352 pages. 29 illustrations, 43 tables. Price \$5.50 postpaid.*

This book is likely to prove a valuable addition to the library of the physician, the health department, or the laboratory worker. In a matter of three hundred pages, divided into five sections, much useful information has been assembled upon the subjects of diseases of domestic animals and birds; rodent affections; human diseases spread by animals; animals as passive carriers of disease organisms; and finally a review of the rôle played by each animal in the spread of disease is included.

The sections dealing with bovine and avian tuberculosis is excellent, as is also the portion of the book devoted to meat inspection. Recent work on contagious abortion receives considerable attention which, at the moment, is most timely. Similarly the section devoted to the subject of food poisoning can be highly commended.

It is refreshing to find references to many recent publications of workers in Great Britain and Canada as well as the United States. Furthermore, the many earlier and fundamental contributions of European investigators receive due recognition.

The author of this book is entitled to much credit for its preparation and the purchaser of a copy will have increased his collection of really useful publications.

J. G. F.

A Handbook of the Mosquitoes of North America—*By Robert Matheson, Professor of Entomology, New York State College of Agriculture, Cornell University. Charles C. Thomas, Publisher, Springfield, Ill., 1929. 26 full page plates, 145 illustrations. 274 pages, 24 figures. Price \$5.50 postpaid.*

While the mosquito problem in Canada does not assume the same importance as in other parts of North America where malaria is of public health concern, yet it is true that mosquito control has become a factor of no mean interest in various parts of the Dominion simply as a result of them being a thorough pest to vacationists and others. This delightfully written and profusely illustrated volume, whilst not encyclopædic, is so arranged that anyone interested in the identification and control of North American mosquitoes has at hand sufficient to meet his needs.

For some years there has been a commendable attempt to reduce the number of sub-families, tribes and genera of the Culicidæ, resulting in a huge list of synonyms for each genus.

However, we think that the author is justified in his protest against the reckless formation of genera and sub-genera following upon this policy of reduction, and is bold enough to refrain from listing sub-genera in this book.

There are several minor criticisms we should like to note. From the point of view of the reader, it might be better to have a subscript to the frontispiece, which is a coloured plate of a female anopheline; page 50, line 20,—*Plasmodium malariae* is the accepted designation for the aetiological agent of quartan malaria, not *P. quartanum* (*quartanæ*); the section dealing with blackwater fever leaves the reader with the impression that this entity is a sequel to infection by any of the three plasmodia causing human malaria; we believe the present conception to be that blackwater fever is probably the result of infection with *P. Falciparum*. The only typographical error that we noted in the whole volume is to be found in the first line on page 94 where the letter "e" has doubtless crept into what was meant to be "tuft".

The illustrations and plates are excellent, the preparation of those of the hypopygia of the Culicidae being aided by the Heckscher Foundation for the advancement of research at Cornell. As one would expect of a Thomas book, the material and workmanship leave nothing to be desired. We recommend this volume to such of our

readers as are interested in mosquitoes from the angle of public health.

P.A.T.S.

Health Heroes Series—Hallock and Turner, Metropolitan Life Insurance Company, Ottawa.

Four booklets of this series have been reviewed, Pasteur, Trudeau, Reed, and Florence Nightingale. These pamphlets are well printed and attractively illustrated. The life and work of each of these heroes is briefly and simply told in such a way as to be both interesting and informative, not only for children but for adults as well. Edna W. Bailey, Associate Professor of Education, University of California, has written an outline for teachers, "Some Ways of Using the Health Heroes Series."

It is encouraging to note that the authors have been chosen from among those best qualified to write authoritatively upon the subjects chosen. The Metropolitan Life Insurance Company is to be congratulated upon the excellence of this series and highly commended for the successful attempt of presenting some of the romantic and historic facts of the story of preventive medicine in such an attractive form.

If in the teaching of health in schools, such material were made use of, an intelligent public opinion in matters of health and the scientific prevention of disease would be assured.

D.T.F.

